

Thompson
2

DIALOGUES

DIALOGUE IN A

LIBRARY.

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1797.

Tommy, having carried his head to be cut off, ordered it to be thrown into a vessel filled with human blood, accompanying her savage revenge with terms of reproach: "There," said she, "not in that blood for which you thirsted, and of which you was always insatiable."

POLYMETAS.

That Cyrus and his army were cut off by the Scythians appears to be sufficiently confirmed; and in the invasion of a foreign country, such incidents are not uncommon: but that not one of the whole was left alive, may be a groundless exaggeration. As they are related only by Justin, their authenticity may be questioned. There are several incidents in the history of the Scythians which seem to be fabulous.

PLUTARCHUS, c. 1. and 2. c. 1. c. 2.

PARMENIO.

I recollect one in particular, which is memorable on account of its singularity. The Scythians, on their third expedition



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light, at a time when the States of Greece
contended for their liberty with the power
of the despots of that nation

ADVERTISEMENT.

Had the character of Cyrus been in
THESE Dialogues are held in a Li-
brary, from the contemplation of which
scene they derive their origin. The sub-
jects arise incidentally, but have, in
general, a concatenation, more or less
obvious, with each other. It is the de-
sign of the Speakers to take first a view
of the Creation, and afterwards to ex-
tend their prospect through the Moral
and Political World.

think, however, that the reception which the masters met with on this occasion would spare the national propensity to the invasion of foreign and distant countries.

THESE DISAPPROPRIATE

It would doubtless be a natural effect, and I think that from such a propensity, both of the Scythians and Egyptians, a way was paved for the more speedy and complete establishment of the Assyrian monarchy. For nations being the people who were led to the invasion of these countries, they would be more disposed to submit to their mutual defence, and as the authority of one potentate might be exerted with greater and more immediate advantage than of several distinct princes, they would be willing to place the whole executive power in the hands of that prince under whom they could enjoy the most effectual protection.

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DIALOGUES

IN A

LIBRARY.

DIALOGUE I.

PARMENIO, SOPHRONIUS.

PARMENIO.

WHAT a noble library! Sophronius.

SOPHRONIUS.

Yes, Parmenio; and the books are not more splendid in appearance than judiciously selected. You will find here none of those imitations which vanity has substituted for the real productions of literary genius and industry. The library of Polymetis, far from being restricted to

B

gratify

gratify the eyes of the spectator, affords the most certain means of attaining to the illustrious character of Good and Great.

PARMENIO.

Your observation suggests the cause of a sentiment which I have often experienced : for I never enter a large library without feeling my mind impressed with a reverential awe, as if in the presence of a great assembly of men renowned for superior talents and virtue. But I should be glad to know the proper method of employing a library towards the attainment of the character you mention.

SOPHRONIUS.

It is the prerogative of useful books, that they contain the principles of knowledge : knowledge leads to wisdom, and wisdom never fails to inculcate the precepts of virtue. By perusing, therefore, such books with attention, and by meditating on the stores which they supply, the mind is gradually improved in the most essential

essential accomplishments of human nature.

PARMENIO.

You say *useful books*, Sophronius, meaning, I presume, those which convey information and instruction to the mind, in contradistinction to such as only afford entertainment.

SOPHRONIUS.

You judge perfectly right of my allusion, though I would not exclude books of innocent entertainment from all pretensions to utility, while they are used only to relax the attention from more serious employment, and are not permitted to occupy too great a part of our time. Besides, such books may be rendered highly subservient to the purposes of morality.

PARMENIO.

Undoubtedly they may; and of such we know many examples. But I wish to be favoured with your opinion more ex-

plicitly respecting the important object which you just now mentioned, *the principles of knowledge*. It appears to me that the subjects of investigation are infinitely various, and so numerous besides, as to prove unattainable by the most industrious research, though continued with unwearied application, to the utmost extent of human life. Such being the case, it is a matter deeply interesting, to determine what province of enquiry affords the particular species of knowledge most useful and important to mankind; for to that, you will allow, we ought principally to direct our attention.

SOPHRONIUS.

I certainly must allow your conclusion; and as you appreciate so justly the importance of the question proposed, there remains little doubt of your anticipating the province to which that importance is attached. It can be no other than the science which relates to the conduct of life.

PARMENIO.

PARMENIO.

That, indeed, is my own idea: I only wish for the precise ascertainment of such moral and prudential rules as are adapted to the purpose. On this interesting subject, various systems have been offered to the world by men of speculation; but some of them being repugnant to each other, they serve rather to confound the perception of good and evil, than to elucidate the distinction. Amidst all this diversity of sentiment, it is remarkable that each of those philosophical sects affects to establish its own peculiar doctrines on the principles of Reason. Is it possible, Sophronius, that Reason can be of so ductile a nature as to admit of being accommodated to such various and opposite theories?

SOPHRONIUS.

It were impious to think so. Reason is the guide which Providence has assigned to man for the direction of his conduct. Its perception is clear, and its decisions,

sions, when faithfully reported, are uniformly founded in truth, though they are often so over-ruled by prejudice or passion, as to be rendered abortive of effect. Ignorance, vanity, interest, caprice, the love of singularity, a variety of motives may darken or mislead the understanding. In the contemplation of speculative points, it is liable to unintentional error, but with respect to moral duty, its admonitions are seldom imperfect.

PARMENIO.

But if men are subjected to moral obligation, and Reason has been implanted for the direction of their conduct, why should it ever prove ineffectual for the purpose intended? Is this not a radical imperfection in the constitution of human nature?

SOPHRONIUS.

An imperfection certainly it is, but not necessarily inherent in human nature.

PARMENIO.

PARMENIO.

How! you mean, I suppose, that by assiduous attention it may always be exerted with effect.

SOPHRONIUS.

Yes; that is my meaning.

PARMENIO.

But why is obedience to its dictates ever resisted by any other internal principle in our frame? This contrariety of influencing powers, each thwarting its antagonist, bears a strong resemblance to the doctrine maintained by some ancient philosophers, that the world is governed by a good and a bad Demon, who are constantly opposing each other.

SOPHRONIUS.

Indeed, what those philosophers have whimsically imagined in respect of the universe, is too certainly verified in the moral œconomy of the human mind. It

is actuated by a variety of passions, which controul the authority of Reason.

PARMENIO.

You acknowledge, then, the reality of that imperfection for which I contend ?

SOPHRONIUS.

I acknowledge an eventual, but not a radical imperfection. The passions are a necessary part of our constitution, without the impulse of which we should be utterly destitute of any motive to action : it is only when improperly directed, or when they exceed their just bounds, that they become reprehensible or injurious.

PARMENIO.

But what is the cause of their improper direction ? must it not proceed from some principle which is natural to the mind ?

SOPHRONIUS.

No ; it proceeds from a cause which is not natural, but the effect of a supervening depravity.

PARMENIO.

PARMENIO.

By what standard shall we judge of the moral rectitude or depravity of the passions?

SOPHRONIUS.

By the standard of virtue.

PARMENIO.

Virtue is indeed a high-sounding name, and has, for almost three thousand years, been made the stalking-horse of visionary sophists; but pray, can ever its precepts be otherwise really expedient than as they are conducive to our interests in the world? and it is obvious, that to these the precepts of virtue, as inculcated by moralists, are extremely repugnant.

SOPHRONIUS.

You astonish me, Parmenio, by the declaration of such sentiments. According to your principle, the greatest crimes would be justifiable, if productive of

of temporal good, or, in other words, if they contributed to the gratification of the passions. Reflect, for a moment, on the consequences; under such a wild and tumultuary mode of action, human society could not subsist a single day.

PARMENIO.

And does it subsist at present upon any other basis than that of reciprocal advantage, and the terror of penal laws?

SOPHRONIUS.

These, doubtless, are the pillars which support the fabric of political associations; and would they not be at once overthrown by the anarchy of general revolt? Could ever reason, or even self-interest, which you regard as the sole object of human pursuit, be more flagrantly violated than by the introduction of such principles as you have suggested? Confess, therefore, that the constitution of the human mind is admirably fitted for a state of existence, in
which

which our obedience or disobedience to the government of reason will hereafter procure us the glorious reward of virtue, or, on the contrary, the punishment of vice.

PARMENIO.

Still I cannot renounce the idea, that reason alone, especially when assailed by the passions, is insufficient for the steady pursuit of any moral purpose, not intimately connected with personal gratification.

SOPHRONIUS.

I perceive, that in your argument you rest much on the uncertainty of the decisions of reason in moral enquiries. To obviate this defect, however, there has happily been promulgated to mankind a system of laws, stamped with an authority superior to that of reason itself. But here comes Polymetis.

DIALOGUE

DIALOGUE II.

PARMENIO, SOPHRONIUS, POLYMETIS.

POLYMETIS.

IF I conjecture right, my friends, ye are engaged in conversation on some interesting topic of morality.

SOPHRONIUS.

Yes, Polymetis, your library is a scene auspicious to the communication of sentiment, and has incidentally excited a kind of dispute on no less a subject than the constitution of the human mind. Parmenio maintains the insufficiency of reason for the government of life, and I had just suggested that the defect is supplied by the sacred scriptures, when you entered the room.

POLYMETIS.

POLYMETIS.

I am happy in having joined you so opportunely, for partaking of the discourse: though wholly untainted with bigotry or fanaticism, I shall ever hold religion as the object of greatest importance to mankind; and should think I had long enjoyed the use of a library to very little purpose, had it not, before this time, confirmed me in the knowledge and practice of those duties which I owe to the beneficent Creator of the universe, and to society. Of the imperfection of human nature, in its most cultivated state, we are all of us abundantly sensible, but have, at the same time, the greatest cause to be satisfied with the station allotted to us, amongst the productions of Omnipotence. We are placed in this world at the head of the creation, with faculties which strongly indicate a superior destiny, and have the animating assurance that we shall exist through all eternity, when this

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transitory

transitory scene is no more.—Lives there a man who can behold such a prospect, without sentiments of complacency and gratitude?

PARMENIO.

To those who are convinced of its reality, the prospect which you describe affords subject of sincere felicitation; but for my own part, I must acknowledge I feel difficulty in subscribing either to the dignity of human nature, or the truth of its existence beyond the grave.

POLYMETIS.

It gives me pain to hear such a declaration proceed from Parmenio.—Whence, my good friend, have you derived your ideas on this subject? Have you formed them by means of deliberate disquisition, or imbibed them from sceptical writers? There are in this library some of the most eminent productions of that kind, which, however ungrateful, I have not hesitated to peruse, though
I have

I have ever since consigned them to oblivion, and they now occupy the shelves merely as monuments of perverted reasoning, and obstinate incredulity. I have called them *sceptical* writers; but there is reason for thinking, that if not always, at least on several occasions, their scepticism is only affected: for, like some ancient philosophers, they seem to pride themselves in maintaining opinions repugnant to the general interests of mankind. From whatever source your sentiments may be derived, you will oblige us by explaining them.—In the first place, by what arguments do you disprove the dignity of human nature?

PARMENIO.

In fact, I see not upon what foundation its dignity can justly be established. Man, though endowed with some peculiar qualities, is nevertheless an animal, affected by external causes, impelled by natural appetites, and subject to accidents, diseases, and death, in the same way

way as the various other species of the animal tribe.—Among the human qualities most obvious to our senses, I might mention, in particular, that of speech; but we perceive, from a variety of instances, that numerous other tribes have the power of reciprocal communication by the voice as well as man.—A quality peculiar to the human species, it must be acknowledged, is laughter; but I am much mistaken if this can be considered as a characteristic of dignity, and by some it has been reprobated as a symptom of folly or madness.—Both these qualities belong exclusively to this arrogant creature, man, who, notwithstanding his assumed superiority, is most of all distinguished from other animals by the conscious guilt of doing wrong. Let me add, that the faculty of reason, on which he piques himself, is infinitely surpassed in certainty, and of consequence, in utility, by the instinct of brutes.

POLYMETIS.

POLYMETIS.

You display so much ingenuity in your arguments on the subject, that we might draw from your own example a forcible proof of the intellectual abilities with which mankind is endowed; but even admitting all your observations to be well founded, man, when closely compared with every other animal, must appear to extraordinary advantage.— Surrounded as we now are by this large collection of books, all of them the production of his understanding or invention, what must we think of the vast capacity which he has received from the hand of his Creator? Where his mind is totally uncultivated, he may indeed seem an object of no high consideration in the scale of animal existence; but view him enriched with the attainments of science, the admirable powers of genius, and exerting himself in the practice or contemplation of virtue, is it possible not to acknowledge his infinite superiority?

C

ity? The wonderful faculties of the understanding, the memory, the imagination, bear the strongest marks of divine origin; made likewise after the image of God, and only a little lower than the Angels; the presages, the hopes, the desires of his soul itself, as an emanation from Heaven, anticipating a future state, are to me an earnest, independent of revelation, that he is destined for immortality.

PARMENIO.

May it not be questioned whether such hopes and desires as you mention prevail in the bulk of mankind? That they are not general, appears evident.

POLYMETIS.

I grant it; but mankind, when viewed in the bulk, appears not in its genuine form; it is weakened by neglect, clouded by vice, and oppressed by sensuality. We are undoubtedly born very ignorant creatures, and it is by the improvement

of

of our faculties only that we arrive at knowledge: what else than intellectual cultivation occasions the prodigious difference which we find between the comprehensions of the rudest peasant and the most intelligent philosopher? Common sense, indeed, is widely distributed by nature, without the aid of industrious application; but common sense, though sufficient for the ordinary purposes of life, is inadequate to the attainment of those arduous parts of science, which not only tend most to display the powers of the human mind, but to elucidate the stupendous wisdom of God in the creation of the universe; and I hold that this purpose is a laudable and useful, as well as an essential object for the contemplation of man.

PARMENIO.

An acquaintance with the more abstruse parts of science must undoubtedly be highly gratifying to an inquisitive mind; but you know it is a maxim long

since inculcated, and generally received, that the most important attainment of man is the knowledge of himself.

POLYMETIS.

I approve of the apophthegm, and revere the authorities upon which it has been recommended; but however much that species of knowledge deserves to be cultivated, it ought not to confine our research from penetrating into the various other provinces of the world in which we are placed, and even as far as possible into the remote regions of nature: for by such means the knowledge of ourselves is improved, through comparative elucidation; and we are taught to admire that infinite wisdom which I just now mentioned as an object most worthy of our attention.

PARMENTO.

Do you consider it as of any great importance to man, that he should employ himself in such speculations? for I look

look upon the gratification of curiosity as the principal object of those researches.

POLYMETIS.

The gratification of curiosity is the motive, but ought not to be the end of those researches. Curiosity, like every other principle which actuates the human mind, must have been implanted by God for some useful purpose; that purpose, there is reason to conclude, was to promote enquiry. Now as infinite wisdom would impel us to no pursuit in vain, we may rest assured that the purpose of enquiry was knowledge; and where the knowledge obtained, by researches into nature, contributes but little to the immediate use or temporal interests of mankind, what other cause can be assigned for the expediency of its attainment, than that we should be made acquainted with the wondrous works of the creation? Such enquiries will likewise best teach us that knowledge of ourselves, which you mentioned a little ago as an attain-

ment of the greatest importance. It will afford convincing proof, that God has formed us with inconceivable wisdom, that we subsist by the continual support of his bountiful goodness, and that it would betray extreme insensibility not to adore Him by the united impulses of admiration and gratitude. It is astonishing to behold the inattention of mankind to the wonderful works of the creation.

SOPHRONIUS.

Before you entered the room, Parmenio and I had agreed that the science of greatest importance to mankind was that which respects the moral conduct of life. The conversation has since taken a different turn, to the propriety of which, however, I most readily assent. As man was formed, and is supported by the great Creator of the Universe, the principal duties of life are justly consecrated to our bountiful benefactor; and the knowledge of these being most clearly evinced by a general view of the creation,

tion, I wish, if the proposal be acceptable to you both, that we might embrace the present opportunity of prosecuting the subject.

POLYMETIS.

Sophronius, I am glad to see you resume your part in the conversation, which both your learning and abilities qualify you so well to maintain; and I shall, with great pleasure, avail myself of so favourable an occasion.

PARMENIO.

I have long entertained a desire to know the sentiments of intelligent men on those subjects; for I must confess that my own opinions upon them are neither clear nor determinate.

DIALOGUE III.

POLYMETIS.

LET us, therefore, my friends, consider what we are, and what is around us. The scene is full of wonderful objects. In the first place, view our own bodies. How astonishing is their structure! how exquisitely are all the parts adapted to each other! and how admirably is each of them formed for its particular function! Without extending our observation to the curious anatomy of the internal organs, the perpetual motion of the heart, the alternate action of the lungs, and the circulation of the blood, those efficient causes by which animal life is maintained, let us consider with how much wisdom every part is arranged, to answer the purpose of utility. The eyes

SOPHRONIS.

are

are placed in our head, as on an eminence, that they may command a more extensive prospect: the ears are likewise stationed in an elevated situation, for the more commodious reception of sound, which naturally ascends: the nostrils have a similar position, because all scent likewise ascends, and are placed contiguous to the mouth, as being useful in assisting us to judge of the state of meat and drink: the taste, which is intended to distinguish the quality of our nutriment, is in a part of the mouth, whence the food or drink may either be transmitted to the stomach, or repelled in their passage, according to the dictates of that sense. But while the faculties of seeing, hearing, smelling, and tasting, are restrained to particular parts, the sense of feeling is, with admirable contrivance, diffused over the whole body; that by communicating intimation of inclement heat or cold, or any other external oppression, we may be excited to our own defence.

SOPHRONIUS.

It is wonderful to reflect on the several distinct modes of perception afforded us by means of the five senses, and how happily they are accommodated to the various channels through which our bodily organs can be affected by external objects; yet there may, in other worlds, exist creatures endowed with different senses, of which we can form no conception. The observations which you have made, Polymetis, are worthy of your enlightened understanding; but let us attend a little more to some particular circumstances respecting our eyes. To secure them against injury, they are covered with a fine membrane, so transparent, that we may see through it, and yet so firm in its texture, as to answer all the purposes of defence. The eyelids are soft and smooth, that they may not injure the membrane, and are made to shut involuntarily, in an instant, at the apprehension of any accident, or to open

at pleasure. They are fortified with a sort of palisade of hairs, to keep off what might be noxious to them when open, and to be a fence to their repose when sleep closes them, and suspends their perception. They are likewise defended by eminences on every side : for on the upper part, the eye-brows turn aside the sweat which falls from the forehead ; the cheeks beneath, having a little elevation, protect the lower part ; and the nose is placed between them as a wall of separation.

POLYMETIS.

Sophronius, you have well elucidated a variety of circumstances relative to the formation and position of the eyes ; I shall next mention a few with regard to hearing. The channel of this sense is always open, as being useful even during sleep ; for if any sound enters, we immediately awake. It has a winding passage, the better to prevent the intrusion of any thing extraneous ; nature also has taken the precaution of lubricating
the

the passage with a viscous humour, that if any insects should endeavour to enter, they might be obstructed in their progress. The external appendage of the ears is prominent, to facilitate the hearing, lest the sound should dissipate before the sense is affected. The upper part, and the entrances, are hard and horny, and their form winding, because bodies of that kind are particularly well adapted to return and increase the sound.

PARMENIO.

What are your remarks upon the nostrils?

POLYMETIS.

They are, in like manner, ever open, because we have continual use for them. Their apertures are narrow, lest any thing noxious should enter them; and they have a constant humidity, for the purpose of excluding dust, and other extraneous bodies.

SOPHRONIUS.

SOPHRONIUS.

Adjoining to the parts we have been considering, what an admirable provision is likewise made for our safety in our throats or gullets ! As the passage for the entrance of the air into the lungs is placed close to that by which our food is conveyed into the stomach, we should be in imminent danger, by every morsel we swallowed, of stopping our breath, had not the great Creator, whose wisdom and care extends to the minutest particular, ordained a little coverlet over the respiratory passage, which constantly shuts down of itself, after every act of deglutition : and though we have occasion for it so often, yet so exactly does it perform its office, that there are very few instances of any fatal accident having happened, from a deviation of the food into the wind-pipe.

POLYMETIS.

We might extend our observations to our hands, our feet, and every other
part

part of our body, for they all manifest a wonderful structure and contrivance, such as could only be the effects of infinite wisdom. There is one particularity in the hand extremely worthy of attention; I mean the difference in the length of our fingers. By this circumstance, when we grasp any thing of a large circumference, the tops of them come to an equality, by which we are enabled to take the firmer hold. It is equally serviceable to our holding between our fingers small things, which would have been apt to slip away, had our fingers been all of an equal length; and many other inconveniences should we have found from such a formation.

PARMENIO.

As you have mentioned the hands and feet, let me ask you if you accede to the opinion of a modern writer, who intimates a conjecture that mankind was intended to go upon all four, in the manner of the quadrupeds?

POLYMETIS.

POLYMETIS.

I know to whom you allude, and I respect the author for his learning and ingenuity in other particulars; but the very formation of the hands and feet, and the articulation of the arms and knees, afford evidence strong as demonstration, that man was intended to walk erect. The sentiment of Ovid on this subject is more worthy of human nature:—

Pronaque cum spectent animalia cetera terram,
Os homini sublime dedit: cœlumque tueri
Jussit, & erectos ad sidera tollere vultus.

SOPHRONIUS.

It has always appeared surprising to me, that men of the medical faculty, who, from their more intimate acquaintance with the structure of the human body, ought to be particularly impressed with a conviction of its wonderful contrivance, should ever have incurred the imputation of atheism: yet *Religio Medici* has long been proverbial.

POLYMETIS.

POLYMETIS.

Whence the imputation has become so, I know not; but certain it is, that the man who can view the structure of the human body, without acknowledging it to be the production of infinite wisdom and goodness, must be utterly destitute of clear perception or of sound understanding.—Who can behold the dissection of a human body without wonder and surprise? What an amazing number of inconceivably fine veins and arteries, that convey the blood to every part of the body! What a multitude likewise of nervous filaments, to give motion and sensation to all! How many muscles and tendons are displayed to the sight! without which the body could not be able to rise up or lie down, to walk or stand still, or perform any of its functions.—What provision do we find made in the stomach, for digesting the food we swallow, and to make it nourish the whole body! How surprising the perpetual motion

tion of the heart, which drives the blood to the remotest extremities! No less so is the constant motion of the lungs, which alternately dilate and contract, to receive and return the air we breathe, without which we could not live. What strong supports of the body are the bones, which yet are so light, that they are no incumbrance to us! How admirably are the joints contrived to render our limbs pliant, and fit for every motion; and yet so strong, as not to be injured by the perpetual use of them! In short, there is not one circumstance which is not sufficient to excite astonishment in any person of common sensibility and common understanding.

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DIALOGUE

DIALOGUE IV.

POLYMETIS.

IN our last conversation, we took a cursory view of the admirable structure of the human body, and had before taken some notice of the nobler part of our constitution, the soul; that divine principle, which renders man superior to the brute creation. The astonishing faculties with which it is endowed proclaim the excellence of our nature beyond all contradiction. What curious arts, and abstruse recesses of knowledge, have been explored by the industry and penetration of man! The capacity alone, which could discover a method of expressing every thought of our minds by twenty-four letters, and all numbers by that of ten figures only, almost exceeds comprehension.

sion. How great a genius did it require to investigate the laws of the solar system, and to derive, from the observation of the celestial bodies, the noble sciences of astronomy and navigation! To invent likewise the many curious instruments made use of in each department, and in that of geography; with those of clocks and watches, for the measurement of time! To dive to the bottom of the ocean in a vessel of glass, and there to remain, during a considerable period, without danger of suffocation! To ascertain the properties of the air itself, an invisible fluid; and to discover its weight, rarefaction, and condensation, by means of the barometer! These are such instances as may justly fill us with astonishment at the prodigious capacity of our species.

SOPHRONIUS.

Does it not seem strange that such a capacity had so long lain dormant in man? for excepting astronomy, which began to be cultivated at an early period

among the Eastern nations, the other sciences and arts are of modern invention.

POLYMETIS.

Navigation could not be much improved before the accidental discovery of the quality of the load-stone; but with respect to the other pursuits, it may indeed seem strange, and we can only account for it from that indolence of mind, in which men too commonly suffer the powers of their nature to stagnate. The capacity that is given, perhaps almost to all, for the attainment of knowledge, is much greater than our sloth and irresolution permit us to employ. The complaint so generally made, of want of time, is far from being such an obstacle to our advancement in knowledge as we are apt to imagine; for our lives, though much contracted by incidental distractions, and inevitable avocations, in procuring the necessaries of life; though lessened by sleep, and other requisite refresh-

refreshments and relaxations after labour, will yet afford us a large space for the exercise both of reason and virtue. The truth is, that we want not time, but diligence, for useful enquiries.

SOPHRONIUS.

I am convinced, that he who will resolutely assign to study those vacancies which intervene in the most crowded variety of employment or diversion, would find himself every day improve in knowledge, and discover how much more may be attained by frequency and perseverance of application, than by sudden and desultory efforts. He that will not suffer himself to be discouraged by imaginary impossibilities, will find the powers of his mind increased by the frequent exertion of them.

POLYMETIS.

Beyond all doubt, Sophronius; and it is a fact, that among those who have contributed to the advancement of learning,

many have risen to eminence, in opposition to all the obstacles which external circumstances could place in their way; amidst the tumult of business, the pressure of poverty, or the dissipations of a wandering and unsettled state.

PARMENIO.

But are you of opinion, that the cultivation of the arts and sciences is the most useful pursuit of mankind?

POLYMETIS.

In point of utility, the arts and sciences are not all either equally or immediately important, some contributing more, and others less, to our convenience or gratification; but they all ultimately tend to the consummation of our happiness, by extending the sphere of domestic enjoyment, enlarging the powers of our mind, and raising our thoughts with gratitude to that Almighty Being, who has bestowed upon us the means of rendering the present life comfortable, and

and of securing, if we reject not the offer, eternal felicity in the next. To these great objects the attention of mankind ought always to be chiefly directed; and they can only be obtained by the pursuits of knowledge and virtue.

SOPHRONIUS.

No man is insensible of the value of knowledge; it is praised and desired almost by all; but few have resolution enough to rouse themselves from the couch of sloth to obtain it. Some who make the effort perform it so languidly, that the slightest invitation of pleasure draws them away from study; any other method of spending the day seems more eligible to them than the use of books; and they are more easily engaged by any conversation, than such as may rectify their notions, or enlarge their comprehension.

PARMENIO.

It seems to me that the objects of knowledge are infinite, and therefore,

that in the pursuit of it we never can completely be gratified.

POLYMETIS,

How far it is possible to extend the limits of knowledge in every direction, the human mind, with all its capacity, is incompetent to determine; but the prosecution of knowledge will always be rewarded both with profit and pleasure; and it is the only kind of indulgence in which the most ample gratification never can be productive of satiety: but since you appear to insinuate some discouragement, Parmenio, at the boundless prospect of universal knowledge, I would observe that Knowledge, properly so called, is that which directs us in the conduct of life, so as to render it more happy and more easy than it is in common.

PARMENIO.

The sentiment you now express coincides entirely with my own idea; and I wish to see it extended in a course of precepts

precepts and observations adapted to practice.

POLYMETIS.

In respect of the precepts on this subject, they are delivered upon the highest authority in the Sacred Scriptures, with this addition, that while they teach us the means of securing tranquillity of mind, which is the utmost degree of happiness attainable in our temporal state, they likewise afford us the glorious prospect of a happy immortality.—Can there be any stronger inducement to receive and practise them?

PARMENIO.

As there are some men who profess to entertain doubts respecting the authority of Scripture, it would afford me great pleasure to hear the question discussed by you and Sophronius, since I know you to be intimately acquainted with a subject of so great importance to mankind.

POLYMETIS.

We should indeed have passed our lives in very criminal inattention, had we not before this time used every endeavour to examine the foundations both of scepticism and faith, and to establish our opinions accordingly. Since you have mentioned the subject as a question, it is our duty to solve it, so far as lies in our power; and I know that Sophronius will concur with me in adopting the proposal.

DIALOGUE V.

POLYMETIS.

PARMENIO, do you believe in historical evidence?

PARMENIO,

Yes, when the narrative appears to be founded upon authentic documents, and the character of the historian, in point of veracity, is not impeached.

POLYMETIS.

But by what rule shall we judge of ancient documents, the authenticity of which it is impossible now to ascertain?

PARMENIO,

I know not any other method of judging, than by the credit in which they appear

appear to have been held during the time of their existence.

POLYMETIS.

Should you be satisfied with the evidence of three or four men, concurring in the recital of certain facts; men who could be actuated by no motive of interest to impose upon mankind, and who should even lay down their lives in confirmation of their veracity?

PARMENIO.

Of all evidence that can be produced of remote transactions, I should consider the kind you mention as the most convincing.

POLYMETIS.

Then the authenticity of the New Testament, and the truth of the Christian religion, rest exactly upon that foundation. The history of Jesus Christ is separately related by the four Evangelists, with a little inconsiderable variation, as their memory was more or less impressed
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by particular circumstances, but without any inconsistency.

PARMENIO.

So far as their evidence relates to credible occurrences, it would be unreasonable to question their veracity; but they have recorded likewise a variety of transactions contrary to the course of nature, and which therefore are difficult of belief.

POLYMETIS.

The recital of those miraculous transactions, so far from reflecting any discredit on their testimony, affords, in my opinion, the strongest proof of its veracity. Nothing less than personal conviction, and a notoriety of the facts, could have induced them to record events of so extraordinary and miraculous a nature, which, if not well founded, would have been effectually disproved by the inhabitants of the country. But the miracles of Jesus Christ cease to be incredible,

incredible, when we reflect by whom they were performed.—They were the work of such a person as never before, nor since, has appeared in the world; the promised Messiah of the Jews, predicted by a number of Prophets; of Him whose divine nature was manifested both at his birth and crucifixion, by extraordinary incidents, and whose precepts and example transcend in moral purity the most celebrated patterns of excellence recorded in the annals of mankind.

PARMENIO.

I must own that your observations impress my mind with irresistible conviction.

SOPHRONIUS.

They cannot fail of operating, with equal efficacy, on the mind of every unprejudiced person, who pays attention to the subject. As Polymetis finished his argument with the crucifixion of our Saviour, it may not be improper to add,

that the Resurrection of Jesus Christ, the grand foundation of our confidence in a future state, is confirmed by the same persons who have recorded the previous events; with additional evidence, of equal authority, rendered, if possible, yet more convincing, by the peculiar circumstances which accompanied its origin, the benevolent zeal with which it was enforced and diffeminated, and the difficulties, dangers, and persecution encountered by the enlightener of the Gentiles, in the discharge of his apostolical commission.—In a word, the whole narrative respecting the history of our Saviour, considered with regard to the evidence of its distinct parts, and the circumambient light which they reflect upon each other, affords such testimony of its truth, as I shall ever maintain to be both satisfactory and irrefragable.

POLYMETIS.

So firmly am I persuaded, from rational evidence, of the truth of the gospel, that I entertain but a very mean opinion of those

those who would reject its authority. But an infidel is less an object of abhorrence than of commiseration, and I might even add, of contempt. If indolence towards inquiry prevents him from being informed, he betrays a degree of weakness which merits the severest reprehension: if on the other hand, he endeavours to inquire, and cannot be satisfied with the testimony, he discovers such a perversion of intellect, as being repugnant to natural sentiment, can only be ascribed to depravity. There is reason however to suspect, that infidelity is often only pretended. As the greatest cowards are generally the most remarkable for declarations of courage, so men of this class conceive an opinion, that they cannot better display a superiority of mind, than by scorning to join in the faith maintained by other men, and even by setting at defiance the threatened vengeance of the Omnipotent himself. I think we may rest assured that all such intimations are void of sincerity.

DIALOGUE VI.

POLYMETIS.

HAVING formerly taken a view of the wonderful formation of man, will it be agreeable to you that we now direct our attention to the World in which we are placed?

SOPHRONIUS.

The transition is natural, and the subject cannot but be interesting.

PARMENIO.

I have only to say, that the prosecution of it will afford me great pleasure.

POLYMETIS.

It has been discovered by diligent inquiries, that this Earth is a round body,
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and that it rests upon nothing, but is pendent in the air, without any visible cause to uphold or support it: that instead of being fixed and at rest, as we suppose, it is continually moving through the regions of the sky at the rate of a million and a half of miles every day, till in the space of twelve months it finishes its circuit round the sun, and comes again to the same point in the Ecliptic. But besides this prodigious motion in its annual circuit, it daily turns upon its own axis like a wheel, or to make use of another comparison, like a top that spins round; and this motion is at no less a rate than a thousand miles an hour. It is by means of this rotation on its axis, that the day breaks in one part of the world, while night approaches in the opposite part; as it turns its sides alternately to the great fountain of light, the Sun, which always remains fixed in one place: for though it appears to us to rise every day in the East, and move to the West, this is only a false appearance, occasioned by the motion

motion of the Earth from west to east, which consequently makes the Sun, Moon, and all the heavenly bodies appear to move the contrary way, from east to west.

SOPHRONIUS.

How astonishingly great must be the force of that attraction, which somewhere exists, to maintain the world pendent; and the gravitation to the centre, by which the loose bodies on the surface of the earth are preserved from flying off in a tangent, by the rapidity of its motion!

PARMENIO.

How wonderful is it likewise, that though our heads be downwards during a great part of the day, we are not sensible of the smallest change in our position!

POLYMETIS.

The whole is amazing beyond the power of human comprehension. By this

constant rotation of the earth, every part enjoys the comfortable light and heat of the Sun, and the grateful vicissitude of day and night.—Without this, one half of it, during half of the year, would be oppressed with intense cold and dismal darkness, while the other half would be scorched and oppressed by a continual heat and light.

SOPHRONIUS.

We may remark another benefit arising from the diurnal motion of the earth, which is, that by this means the whole earth never lies a moment unconscious or torpid : if in one spot of it more animals lie buried, and extinguished as it were in sleep, on another, at that very time, they are all alive and active, enjoying happiness, and performing the offices of life.

POLYMETIS.

It would indeed, in some measure, be like an extinguishing of the creation, was the
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the whole earth to fall together into the death-like state of sleep and inaction every twenty-four hours : but according to the wise arrangement of Providence, while we in this quarter of the world are obliged to fall into a state of inaction, others, in a distant part, are actively employed, perhaps for our convenience or gratification, in providing and shipping off their manufactures and products, till we arise again into action to do the same, while they sink into a state of inactivity.

SOPHRONIUS.

Let us now direct our attention to the prodigious and almost incredible multitude of herbs, trees, fruits and flowers, which the earth produces.—How astonishingly and delightfully various are their kinds ! how exquisitely delicious are some ! how beautiful are others ! and how useful, did we know the utility of each of them, are all ! Is it not amazing, that the same earth and air should produce so many kinds, quite different from

each other in figure, colours, and properties! Our admiration is likewise excited by the general colour with which it has pleased the Creator to beautify every plant.—Had all the fields been cloathed in white or red, what eyes could have endured perpetually the lustre of their drefs? If he had bestowed upon them darker colours, who could have been delighted with so sad and mournful a spectacle? An agreeable verdure holds the mean between these two extremes, and is so happily adapted to the structure of the eye, as to refresh and preserve the sight, instead of tiring and exhausting it. But what at first we should judge to be one colour, is an astonishing variety of shades; scarcely any plant is coloured exactly as another; and this surprising variety, which no art can imitate, is farther diversified in each plant, which, in its first shooting forth, in its growth and maturity, assumes a different verdure.

SOPHRONIUS.

SOPHRONIUS.

The same may be said of the figure, smell, taste, and uses of plants, both for nourishment and medicine.

POLYMETIS.

Let us transport ourselves in thought to a field covered with flowers, or a garden well cultivated. What beautiful enamel, what colours, what richness, what fragrance, and at the same time, how great a harmony in the shades with which they are blended! From what source could arise the beauties so fitted to excite admiration? What is in itself the principle of so much splendor, and of ornaments so infinitely diversified? It is from God they have received their astonishing decorations; and it may well be said of a multitude of kinds, that "Solomon, in all his glory, was not arrayed like one of these."

SOPHRONIUS.

I seldom ever behold a beautiful flower without reflecting on the blind-

ness and vanity of mankind, who reckon upon beauty, youth, authority, and human glory, as solid benefits, not remembering that they are as the transient flower of an herb, which to-morrow shall be no more.

POLYMETIS.

Hitherto we have considered the Earth as a field, or a garden of herbs; let us now consider it as a rich orchard, abounding with all kinds of fruit, which succeed one another according to the seasons.—Let us figure to ourselves one of those trees extending its branches, bowing down to the earth under the weight of delicious fruit, the colour and smell of which invite the taste of the beholder. This tree, by the pomp it displays before our eyes, seems to cry out, “Learn of me how great is the goodness and munificence of God, who has formed me for you.—It is neither for him nor for me that I thus abound in riches. He stands in need of nothing, and I can make no use
of

of what is given me.—Bless him and unload me ; give thanks to him, and as he has made me the minister of your entertainment, do you become the minister of my gratitude.”—Such invitations as these we seem to hear from every quarter ; and as we advance in the study of nature, we shall discover new subjects of praise and admiration.

SOPHRONIUS.

Nothing exhibits in so strong a light the goodness of God to all his creatures, as the knowledge of Nature ; and the indifference of mankind to this pleasing and instructive subject is a mark of great insensibility.

PARMENIO.

The knowledge of nature, in the light that each of you considers it, affords not only high entertainment, but an inexhaustible source of gratitude to the beneficent Creator of the Universe.—Were it consistent with your convenience and inclination,

inclination, a prosecution of the subject, through some parts at least of the animal kingdom, would be extremely desirable. I do not mean an extensive and systematical view, but a concise and general prospect of the interesting objects which it contains.

POLYMETIS.

You were going to speak, Sophronius?

SOPHRONIUS.

I meant only to express my approbation of what Parmenio suggests.

POLYMETIS.

And mine shall never be withheld, where the prosecution of knowledge is the subject. Let us, therefore, enter upon it in our next conversation.

DIALOGUE VII.

POLYMETIS.

WHAT an amazing abundance of fish do the waters produce of every size! These animals have neither feet nor arms: their very head cannot be freely moved; and were we to consider only their figure, we should think them deprived of all that was necessary for the preservation of their life: yet with their few outward organs, they are more nimble, dextrous, and artificial than if they had several hands and feet. The use which they make of their tails and fins carries them along as arrows, and gives them a velocity like that of the birds in the air.

PARMENIO.

As the fish devour one another, is it not surprising that the different kinds should still continue to subsist?

POLYMETIS.

POLYMETIS.

God has provided for it, by multiplying them in so prodigious a manner, that their fruitfulness infinitely surpasses the havoc which is made amongst them by their mutual desire of depredation. Sensibility is interested in reflecting how the little ones should escape those of superior size, which look upon them as their prey, and are continually in pursuit of them. But this weak race are swifter in their course than the others; they creep into places where the low water will not admit of the larger fish, and it seems as if God had given them a foresight in proportion to their weakness and dangers.

SOPHRONIUS.

In respect of fish, there are many considerations particularly worthy of attention, and which all evince in the plainest manner the care and goodness of Providence towards man. While the sea-fish live in the waters, loaded with salt, that we can scarce bear a drop of them in our mouths,

mouths, and exist in that element in perfect vigor and health; yet they preserve in the midst of salt a flesh which has not the smallest taste of such a substance. The best of those tribes, and such as are most fit for the use of man, draw near the coast, as if to offer themselves to his disposal; whilst many others, which are useless to him, keep aloof from the shore.

POLYMETIS.

This peculiar favor towards us is every where to be discerned: and the innumerable shells which are spread upon the shore hide different kinds of fish, which, with a very small appearance of life, are sure to open their shells at stated times to take in fresh water: and retain in their habitation, by speedily joining its parts together, the prey which falls into that snare.

SOPHRONIUS.

We see a surprising imitation of reason in many animals, but it no where appears
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in a more evident manner than in the industry of birds in building their nests. In the first place, what master has taught them that they have need of them? Who has enjoined to prepare them in time, and intimated how they should build them? What mathematician has suggested to them the figure; or what architect instructed them to choose a firm place, and to build upon a solid foundation? What tender mother has advised them to cover the bottom with a soft and delicate substance, such as down and cotton? And when those materials are deficient, who has suggested to them that ingenious charity, which leads them to pluck off so many feathers from their own breasts, with their beaks, as is requisite for preparing a convenient cradle for their young?

In the second place, what wisdom has pointed out to every distinct kind a peculiar manner of building their nests, so as to observe the same precautions, though in a thousand different ways? Who has
commanded

commanded the swallow, the most skilful of birds, to draw near to man, and make choice of his house for her nest, within his view, without fear of his knowing it, and seeming rather to invite him to a consideration of her labour? Neither does this bird build like others with little bits of sticks and stubble, but employs cement and mortar, and in so solid a manner, that it requires some pains to demolish its work: yet in all this it makes use of no other instrument but its beak. Do I weary you with my observations?

POLYMETIS.

So far from it, they are highly agreeable.

PARMENIO.

Proceed, Soprhonius: your remarks are ingenious and interesting.

SOPHRONIUS.

Who has made all the birds comprehend that they must hatch their eggs by sitting upon them? that this necessity was indispensable? that the father and mother could

could not leave them at the same time, and that if one went abroad to seek for food, the other must wait till its return? Who has fixed in the calendar the precise number of days that this assiduous attention is to last? Who has excited them to assist the young, which are already formed, in coming out of the egg, by first breaking the shell? and who has so exactly instructed them in the very moment before which they never come?

Who has given lessons to all the birds, upon the care they ought to take of their young, till such time as they are grown up, and in a condition to provide for themselves? Who has made them to distinguish such things as agree well with one species, but are prejudicial to another? And amongst such as are proper for the parents, and unfit for the young, who has taught them to distinguish what is salutary? Who has instructed several among the birds that wonderful industry of retaining food or water in their gullet, without swallowing either one or the other, and

and preserving them for their young, to whom first preparation serves instead of milk?

But let us set bounds to our observations on the industry of birds, for the subject is infinite, and hearken for a moment to the concert of their music, the first praise which God received from nature, and the first song of thanksgiving which was offered to him before man was formed. All their sounds are different, but all harmonious, and altogether compose a choir which men have but poorly imitated.

Some of the birds are extremely beautiful, nor can any thing be more rich and variegated than their plumage. The peacock, for one, is lavishly adorned, and displays with gold and azure the shades of every other colour. This bird seems sensible of its advantage, and looks as if designed to exhibit its beauties to our eyes, when it expands that splendid circumference which sets them all to view.

In examining the feathers of the rest, we find one thing very singular in those of the swans and other river-fowl; for they are proof against water, and continue always dry : notwithstanding which we cannot discover either the artifice or difference of them.

Looking at the feet of the birds last mentioned, we observe upon them webs, which plainly mark their distinction. While so sure are those birds that they run no hazard by throwing themselves into the water, others to whom God has not given the like feathers or feet, are never so rash as to endanger themselves by the experiment. Who has told the former that they run no danger, and who retains the other from following their example? It is not unusual to set duck-eggs under a hen, which in this case is deceived by her affection, and takes a foreign brood for her natural offspring. They run into the water as they come out of the shell, nor can their imaginary mother prevent them by her repeated calls

to desist. She stands upon the brink in astonishment at their rashness, and still more at the success of it. She finds herself violently tempted to follow them, and warmly expresses her impatience, but nothing is capable of carrying her to an indiscretion which the author of nature has prohibited.

We should never have done, should we undertake to consider the many miracles of a like nature with those which have been related. I shall content myself with one observation more, which relates to birds of passage.

They have all their allotted times; which they do not exceed; but those times are not the same for every species. Some wait for the winter, others the spring; some the summer, and others the autumn. There is amongst each class a public and general rule of government, which guides and retains every individual bird in its duty. Before the general edict, none thinks of departing; after its promulgation no one tarries behind. A kind of

council fixes the day, and grants a certain time to prepare for it; after which they all take their flight: and so exact is their discipline, that the next day there is not a straggler or deserter to be found.

POLYMETIS.

Wherever we turn our eyes, we find fresh matter of admiration, at the infinite wisdom of Providence, and the amazing instinct which appears through the whole creation. The single instance of the dog, which is known to all, shews the power of God, in giving all the outward appearances of understanding, fidelity, friendship and gratitude, perhaps without the principle of them.

The actions of the bee are no less admirable. Instead of contenting itself with sucking the honey, which is better preserved in the cups of flowers than any where else, and feeding upon it day by day, it lays up a provision for the whole year, and principally for the winter. It loads the little hooks which adorn its legs with

with all the wax and gum that it can carry; and in sucking up the honey with the trunk fixed at the extremity of its head, it avoids the daubing of its wings, of which it stands in need to fly from place to place, and to carry it home.

If care is not taken to prepare a hive for it, it makes one itself in the hollow of some tree or rock. There its first care is to form the comb, which it composes of small equal cells, that they may be the better joined, and leave no interval between. It then pours out the honey, pure and unmixed, into those small reservoirs, and how plentifully soever its magazines are filled, it allows itself no rest, until the time of labour and harvest is over. In this Republic, there is no idleness, no avarice or self-love, but all is in common. What is necessary is granted to all, but to none a superfluity; and it is for the public good that their acquisitions are preserved. New colonies, which would be a burden to the State, are sent
F 3 abroad:

abroad: they know how to work, and are obliged to do so by being dismissed.— Among the best governed nations have we the copy of so perfect a model?

But let us pass from the bee to the ant, which resembles it in many respects, except that the former enriches man, and the latter strives all he can to impoverish him, by stealing from him. This little animal is informed that the winter is long, and that the ripe corn is not a great while exposed in the field. Thus the ant never sleeps during harvest. It draws along, with the little instruments which are fixed to its head, grains of corn which are thrice as heavy as itself, and goes backward with them as well as it can. Sometimes it finds a friend by the way which lends its assistance, but never waits for it.

The repository, where all is public, and no one thinks of making a separate provision for itself, is composed of several chambers, which communicate with each other by galleries, and which are dug so deep,

deep, that neither the winter rains nor snows can penetrate them. When their granaries are full, and the winter comes on, they begin to secure the grain, by biting off the two ends of it, and thereby preventing it from growing. Thus their first object appears to be a care for futurity, to which they are determined rather by motives of prudence than necessity. Hence we may observe what a fund of industry God has placed in this little animal. He has given it a kind of prophetic understanding, to oblige us to recur to him, to whom alone it belongs to work such prodigies; who cannot, in my opinion, more evidently shew us that he is the source of wisdom, than by exhibiting such palpable operations of it in an agent so extremely diminutive.

Can we sufficiently admire the industry of certain animals, which spin with such art and delicacy, and all appears to be the effect of thought, and a mathematical contrivance? Who has taught the spider, an animal in other respects contemptible, to

form such fine threads, so equal in their texture and so artificially suspended? Who has instructed it to begin with fixing them to certain points, to unite them all in one common centre, to draw them first in a right line, and then to strengthen them by circles exactly parallel to each other? Who has told it that those threads should be a snare to catch other insects that have wings, and that it could not procure them but by this stratagem? Who has appointed him his place in the centre, where all the lines meet, and whence it may be informed by the slightest motion, that some prey is fallen into its nets? Lastly, who has told him, that his first care then should be to embarrass the wings of that prey, by new threads, lest it should still have the power of disengaging itself from confinement?

All the world is acquainted with the labours of the silk-worm; but have the most skilful artists hitherto been able to imitate them? Have they found out the secret of drawing so fine a thread, so strong,

strong, so even, so bright and uniform? Have they any materials of greater value than this thread for making the richest stuffs? Do they know how this worm converts the juice of the mulberry-leaf into golden threads? Can they assign a reason why that which was liquid before being exposed to the air, should, after its exposure to that element, grow strong, and lengthen itself *in infinitum*? Can any of them explain how this worm is taught to form itself a retreat under the numberless windings of the silk, which has proceeded from itself, and how in this recess it obtains wings, of which it was originally destitute?

SOPHRONIUS.

Is it not surprising that man, placed in the midst of nature, which presents him with the greatest spectacle it is possible to imagine, and surrounded on all sides with an infinity of wonders made for his contemplation, should scarcely ever think either of considering those wonders,
which

are so deserving of his attention, or of taking a view of himself? He lives in the midst of a world of which he is the sovereign, as a stranger, who looks with indifference upon all that passes in it, and as if it was not his concern. But the Universe presents to our eyes a large picture, of which every part has its use, every line its grace and beauty, though it is most wonderful when considered in the whole together. By laying before us so beautiful a spectacle, it teaches us to observe the order, symmetry and proportion, that reigns throughout all; and with what uniformity this order, both of the aggregate and of every part, is preserved and maintained; leading us by that means to the invisible hand and the directing wisdom by which the whole is displayed.

PARMENIO.

Never before did I attend to such speculations on the economy of nature. It appears to me to be a subject of vast extent, and not more curious in point of

enquiry, than useful for the most important rational purposes, with which it is immediately connected.

POLYMETIS.

You judge right, Parmenio; it may be rendered of the most important advantage to us, both in regulating our sentiments of a superintending Providence, and our conduct in life. We are instructed by God himself that this is the proper use we ought to make of the creatures, which all teach us our duty. He sends the sluggard in the Scriptures to the ant, to learn industry; the ungrateful to the ox and ass, who make a grateful return for their master's care; the inconsiderate to the stork and the swallow, who know their appointed times. Jesus Christ lays down the consideration of the lillies of the valley and the birds of the air, as an instruction to all mankind, to rely implicitly upon the care of a Providence, which is watchful over all, abundant in goodness, and almighty. We should not
answer

answer the intentions of Divine Wisdom, and shall lose many important instructions, if we do not consider the footsteps of the Deity in all his creatures, as he has been pleased to display himself, and point out our duty in them.

THAT men in general look with indifference on the wonders which attend them, can be only owing to want of consideration. Entirely occupied with their own little concerns, and the narrow scenes in which it is their lot to be stationed, they never accustom their thoughts to range abroad, and take a wide survey of nature in the luxuriant fields of speculation.—What an amazing prospect does it present of quadrupeds, birds, fishes, and, above all, of insects! We are assured, by those who have taken pains to investigate the animal creation, that of quadrupeds, they have found more than a hundred and fifty kinds, entirely different from each other, of birds,

DIALOGUE

DIALOGUE VIII.

POLYMETIS.

THAT men in general look with indifference on the wonders which are around them, can be only owing to want of consideration. Entirely occupied with their own little concerns, and the narrow scenes in which it is their lot to be stationed, they never accustom their thoughts to range abroad, and take a wide survey of nature in the luxuriant fields of speculation.—What an amazing prospect does it present of quadrupeds, birds, fishes, and, above all, of insects! We are assured, by those who have taken pains to investigate the animal creation, that of quadrupeds, they have found about one hundred and fifty kinds, entirely different from each other; of birds,

birds, upwards of five hundred ; of fishes, three thousand ; and of insects, twenty thousand.—But amazing as this number is, they conjecture that the whole sum of terrestrial animals exceeds, by a third part, what they have discovered, and fishes by one half. The great naturalist, Mr. Ray, after employing some years in discovering the different kinds of insects, declared that he thought, if he was to employ twenty years longer, with the utmost diligence and industry, in searching them out, he should not come to an end of the enquiry.—Extremely numerous likewise are the different kinds of plants, they being reckoned more than eighteen thousand.

SOPHRONIUS.
Our astonishment is not only excited at the great number of different kinds of animals in the world, but of the vast multitude of each kind, especially of those which are destined for the food of man. In this small spot of our own island,

island, there are, by computation, twenty-four millions of sheep and lambs daily feeding on our downs and plains.—More than one thousand fattened oxen are slaughtered and consumed every week in the capital only, besides many thousand sheep, hogs, calves, pigs, and lambs.—Many hundred ships are annually employed in taking cod on the bank of Newfoundland, and they generally bring away twenty or thirty thousand cod a-piece, in the whole an immense number. But though this vast annual consumption has continued for upwards of two hundred years, yet they still are found in equal plenty. If we extend our thoughts farther, and include the whole world, what an inconceivable multitude of animals must be consumed every day by the inhabitants, and yet there is still a fresh supply!

POLYMETIS.

The more we consider the astonishing number of creatures daily subsisting on the

the earth, the more will our ideas of the creation be raised and increased. The mind is almost lost amidst so many millions of the animal tribes.—What less than an omnipotent God could prepare sufficient food, at all times and seasons, for so infinite a number of creatures?

SOPHRONIUS.

Our ideas of the earth we live on are likewise formed from those little spots of it only, which we ourselves have seen; but did we stretch our imagination to embrace the whole, what a vast and magnificent habitation would it appear, since the whole face of it is above one hundred and ninety-nine millions of miles! How many kingdoms and people, how vast a multitude of animals, beasts, birds, and fishes; how immense a number of trees, and plants, and flowers; what numberless buildings, what amazing and various scenes may we not suppose upon so vast a surface! Here stupendous rocks and mountains, there immense fields and plains; here vast woods, and there magnificent

nificent cities ; here boundless seas, and there noble rivers ! Our wonder will still rise higher, if we consider what a vast quantity of matter the earth consists of ; no less, as is proved by mathematical calculation, than two hundred and sixty-four thousand millions of miles solid contents ! a work too grand for any other than a God to execute.

POLYMETIS.

Let us consider the two great elements of which our habitation consists, viz. Land and Water.—How wonderfully are both these contrived for our use and benefit ! Had the land been of a little harder consistence than it is, man would have been unable to cultivate it : had it been softer, it would have been insufficient to bear him. How great an instance of the wisdom and goodness of God do we perceive in that universal covering of the earth, the grass of the field ! We find it is the proper food of almost all animals ; it accordingly springs

G

up

up in amazing abundance, almost every where: though continually fed upon and cropped, it as often renews itself again; it endures through all seasons: even winter, which nips almost every thing that flourished in the summer, hurts the grass but little.—Was there not such a disposition in the earth, to produce and nourish the grass without any cultivation, where could sustenance be found for so many millions of living creatures, which we have daily occasion for, either for our food, or to assist us in our labour? By this means too, in making the grass to spring up every where spontaneously, God has provided for the creatures of the forests, &c. which have never known the care of man: “For his tender mercies are over all his works.”

SOPHRONIUS.

It is observable, that though the grass grows thus wonderfully every where, in all soils and situations, we find most other plants and trees dwindle in a soil which does

does not agree with them. How great a mark then, of the wisdom and contrivance of the Creator, are the various soils and moulds of which this earth consists ! so that there is a fit provision for every single vegetable.

POLYMET'S.

Yes, Sophronius, we find that different vegetables require different soils ; and yet experiments shew that they owe not their life and growth to the earth itself, but to some agreeable and congenial juices or salts, &c. residing in the earth. The great Mr. Boyle ordered his gardener to dig up, and dry in an oven, some earth fit for the purpose, to weigh it, and to set in it the seeds of a kind of Indian pompion. The seeds, when sown, were watered with rain or spring-water only ; but though fruit was produced in one experiment of near three pounds, and in another of above fourteen pounds, yet the earth when dried, and weighed again,

again, was scarcely any thing diminished in its weight.

He adduces another experiment from Helmont, who dried two hundred pounds of earth, and planted in it a willow weighing five pounds, which he watered with rain or distilled water; and to secure it from any earth getting in, he put over it a cover of tin perforated. After five years, weighing the tree with all the leaves it had produced in that time, he found it to weigh a hundred and sixty-nine pounds, three ounces; but the earth to be diminished only about two ounces in its weight.

SOPHRONIUS.

There is reason to think, from these experiments, that plants derive much of their nourishment from the air; and indeed later experiments evince that this fluid is absolutely necessary for their existence.

POLYMETIS.

POLYMETIS.

To the convenience which the various soils that cover the earth are of to vegetables, we may add their great use and benefit to various animals; to many kinds of quadrupeds, fowls, insects, and reptiles, who make in the earth their places of repose and rest; their retreat in winter, their security from their enemies, and their nests to accommodate their young; some delighting in a lax and porous mould, admitting them an easy passage; and others in a more solid earth, that will better secure them against injuries from without,

SOPHRONIUS.

But there were many other things necessary for the convenience of man; therefore, besides the advantages he derives from the surface, the very bowels of the earth have been stocked with a variety of materials for his use: thus, in one place he finds stone and slate; in another

other, clay, proper for making bricks; in another, lime; all which are adapted for building him a convenient habitation, lodgments for the sheltering of his cattle, granaries for his corn and fruits, churches for public worship, and halls for public meetings.—Here he finds iron, copper, lead, and tin, which enable him to make instruments for tilling the ground, cutting down timber, and knives to cut his food in pieces, vessels in which to dress it, and a great number of other utensils useful for the conveniency of life. In many places are inexhaustible quantities of coal, to supply us with fuel, and which is of yet more service, being endowed with the property of softening iron, and rendering it malleable. In the earth are likewise found gold and silver, convenient for the carrying on of trade and commerce with the greater facility.

PARMENIO.

There, Sophronius, you have mentioned the *irritamenta malorum*.—Had it

not

not been happy for mankind that these metals had never been discovered?

SOPHRONIUS.

You well know, Parmenio, that we ought never to argue against the use of any thing from the abuse of it: if not gold and silver, some other medium of exchange must necessarily have been adopted; and none could be so convenient as those substances, which, from their proportionable scarcity, acquire the greater estimation.—The iron money of Lycurgus would not be portable even in a moderate quantity; and you will own, that the most ancient medium of traffic, which appears to have been sheep or oxen, could not well be adopted, when the object of barter amounted in value to only a part of those animals.

PARMENIO.

I very readily acknowledge the justness of your observations.

POLYMETIS.

Besides those we have already mentioned, there are many other inexhaustible treasures laid up for us in the earth; and here we may admire with what infinite wisdom God has disposed every thing. He might have placed all these on the surface of the earth, to be near at hand, and ready to be employed on all occasions; but then the vast quantity of them would have almost covered the earth, and have obstructed all husbandry, as well as the free passage of the inhabitants.—Metals, stores, and a hundred other materials, which are constantly employed for our use, and were designed to be a never-failing treasure for the service of all succeeding ages, are carefully locked up in the vast storehouses under our feet, to which we are enabled to resort in all cases of necessity; for Providence has so wisely ordered it, that they are not buried near the centre of the earth, nor yet at such a depth, as

to

to make them inaccessible to us, but at such a proper distance below the surface, as that the coat of earth above them should have a sufficient depth of soil to produce fruits for the use of man, and yet not be of such thickness, as to prevent his digging into those subterraneous magazines of treasure, which are deposited to supply his exigencies,

at hand, and ready to be employed on all occasions; but then the vast quantity of them would have almost covered the earth, and have obstructed all husbandry, as well as the free passage of the inhabitants.—Metals, stones, and a hundred other materials, which are constantly employed for our use, and were designed to be a never-failing treasure for the service of all succeeding ages, are carefully locked up in the vast store-houses under our feet, to which we are enabled to resort in all cases of necessity; for Providence has so wisely ordered it, that they are not buried near the centre of the earth, nor yet at such a depth, as

DIALOGUE

DIALOGUE IX.

PARMENIO.

I AM perfectly convinced of the wisdom and goodness of Providence, so conspicuously manifest in all the observations you have made: but there is one thing that seems to me unaccountable, and respecting which I should be glad to know your opinion. It is, why there should be so many animals, and insects in particular, which, so far from being useful, are extremely noxious; some by their fierceness, and others, as well as many plants, by their poisonous nature.

POLYMETIS.

The subject of your question, Parmenio, has sometimes excited my own reflections. The proper answer seems to be,

be, that in great variety, the greater power and contrivance are seen; and that the fierce, poisonous and noxious creatures serve as rods and scourges to chastise us; as means to excite us to wisdom, industry and care. It is possible, besides, that those creatures may be of some use in the creation, which we are not able to discover. Though the infinitely wise Creator has put it in the power of some animals to chastise us, yet he has shewed no less wisdom and kindness, in ordering many, if not most of them in such a manner, that it shall be in the power of man, and other creatures, to obviate or escape their evils. For besides the antidotes afforded by minerals, vegetables, &c. many, if not most of our European venemous animals, carry their cure, as well as their poison, in their own bodies. The oil, and I believe the body too of the Scorpion, is a certain remedy against its stroke. A bee, wasp, or hornet, crushed and rubbed, and then applied to the part with a bandage, is a certain cure for the sting of those creatures;

tures; and it is reputed, that the flesh, especially the head of vipers, affords a remedy for their bites. Our viper-catchers have a remedy in which they place so great confidence, as to be no more afraid of the bite of a viper, than of a common puncture; immediately curing themselves by the application of their specific. This, though they keep it a great secret, is found to be no other than viper-fat, presently rubbed into the wound.

SOPHRONIUS.

As to the means of escaping the mischief of such noxious animals, besides what may be effected by the care, industry and sagacity of man, some of them are so contrived as to give warning or time for escape, to creatures in danger of being attacked by them. Thus, for instance, the rattle-snake, the most poisonous of any serpent, which darts its venom to some distance, gives warning involuntarily by the rattle in its tail. So the shark, the most rapacious animal of the waters, is forced

forced to turn himself on his back, before he can catch his prey. Sir Hans Sloane observes, that were it not for the time required in turning itself, there would be nothing that could avoid it: it is so quick in swimming, has such vast strength, with a most capacious throat, and extremely voracious.

POLYMETIS.

That terrible creature the crocodile, can only catch its prey directly before it, and not on one side, being unable to turn its body any way without taking a great compass; during which time, those it pursues are enabled to make their escape: for otherwise, from the velocity of its motion, there is scarce a possibility of escaping it, when it runs straight forward.

PARMENIO.

May I beg the favor, Polymetis, to have a description of that animal? for it is a creature celebrated in antiquity, for insidious and hypocritical weeping.

POLYMETIS.

POLYMETIS.

I shall give it you with great pleasure in a moment: but the story of their weeping is merely fabulous.

The crocodile is an amphibious animal, living both by land and water, which, from an egg not much larger than that of a turkey, arrives sometimes to eight or ten yards in length. For, though other creatures have a certain period to their growth, the crocodile, as is said, continues increasing in length, as well as thickness, to the end of its life, which is reported to be about a hundred years. Its head is flat above and below, with jaws wide enough to swallow a man entire; a sharp long snout, full of teeth, but no tongue. The body is of equal dimensions, covered on the back with high scales, like the heads of broad nails; of a greenish colour, and so hard, that a halbert cannot pierce them. Its tail is long, and covered with such scales as the back; its belly white and pretty tender, being the only part

part where it is easily wounded. It has four short legs, with five claws on its fore, and four on its hinder feet. It moves only the upper jaw in eating. Its flesh is not poisonous, but insipid. It is a very ravenous and subtle creature, hiding itself in the sands, and behind the projecting banks of rivers, to watch the beasts coming to drink. When any comes within its reach, it rushes with it into the water, and holds it down till it is strangled. The only way to escape their pursuit, is by flying in circles: for their body being of a vast length, requires some time to turn about; but directly forward, they can run with great swiftness. It lays its eggs in the sand, to be hatched by the heat of the sun.

PARMENTO.

What a formidable animal! The terror it must inspire was probably the cause of its being worshipped by the ancient Egyptians.

POLYMETIS.

POLYMETIS.

That may have been one cause : but they seem likewise to have held it in veneration for destroying the numerous animals which breed in the slime of the Nile, after the waters have subsided.

The crocodiles would increase prodigiously in Egypt, was it not for the activity of the ichneumon, which destroys their eggs. You know how much that little creature has been celebrated for its courage; but as perhaps you have never seen a poem on that subject, written by Opianus, a Greek physician, I shall shew you a translation of it, as one of my earliest poetical productions.

SOPHRONIUS.

You will greatly oblige us both by the communication.

POLYMETIS.

I shall read it, upon the condition, however, that neither you nor Parmenio,

shall, now at least, express any opinion
on the subject.

Small is th' Ichneumon, yet its fame extends,
For mighty deeds, to earth's remotest ends.
The greatest monster, bred where Nilus flows
In his sev'n streams, it craftily o'erthrows.
For when the Crocodile, with sleep oppress'd,
Stretches his weary limbs and turns to rest;
His snouted mouth, and jaws immense, unbound,
A throat disclosing of a hideous round;
The fly Ichneumon, wond'rous in its art,
Each motion views attentively apart;
Till his huge sides it sees in heavings rise,
And lockt in sleep th' enormous monster lies.
Then from the mud, in rapid course it bends,
And boldly down the dreadful throat descends.
Now rous'd from sleep, and pierc'd with inward pain,
The raging monster seeks the watry plain;
And now the slime, and now the deep explores;
Now restless rolls him on the sandy shores:
To furious rage his fervid anguish fires,
And his foul mouth hot clouds of smoke expires.
The glad Ichneumon, master of the prize,
Unmov'd beholds the mortal fury rise:
While in his entrails fixt, it probes around,
Tears ev'ry nerve, and feeds in ev'ry wound;
Till fated with the carnage and the gore,
It leaves the corpse extended on the shore.

O highly for such enterprize renown'd!
What words, Ichneumon, can thy deeds resound?
What strains thy intrepidity relate,
Who bravely ventur'd in the jaws of fate?

Nay, pray, remember my injunction.

SOPHRONIUS.

Then we must forbear.

Does it not evidently appear, that the great variety of things in the world is a most wise provision for the uses of the various creatures which inhabit it? Some for food, some for medicine, some for habitation, some for utensils, and some for recreation and pleasure, either to man, or to some of the inferior creatures themselves; even for which inferior creatures the liberal Creator has provided all things necessary, or any way conducive to their comfortable living in the world; as well as for man.

POLYMETIS.

Let us next consider the element of water, which we shall find no less fitly
and

wonderfully disposed for our service. Let us reflect a little upon its nature and qualities: how admirably are these adapted to make it infinitely useful to us! Had it been of a little finer consistence than it is, it might perhaps have served to nourish the earth, and satisfy our thirst: but then, of how many benefits which it now affords us, should we have been deprived? For had it been of a lighter nature, it could not have supported boats and ships upon it. If on the other hand, instead of a thinner, water had been of a thicker consistence than it is, it would have been no less unfit for our use: For then it would have stagnated, instead of running, would not have answered the purpose of navigation, and would have produced putrid diseases over all the creation. Besides, it could not have penetrated into the pores of the earth, to render it fruitful, nor the roots and fibres of trees and plants, to give them their nourishment: neither would it have been of that service which it now is to all

creatures, in satisfying their thirst, and diluting the food they eat, so as to make it fitter for nourishment.

SOPHRONIUS.

As water is thus of such infinite service to us for various purposes, what an instance of goodness and design is it, that it is dispersed through the whole earth! When we but reflect a little on the vast length of many rivers, such as the Rhine, which runs above six hundred miles; the Danube, which passes over fifteen hundred; the Niger, which waters three thousand three hundred miles of land in the sultry climes of Africa; the river of Amazons in America, which runs three thousand miles, and discharges itself into the ocean by an outlet of prodigious breadth; besides the Ganges, and many others, some of which run the vast course of six thousand miles; when we consider this, our reason tells us, that nothing but the omnipotent hand of God could form
and

and hollow channels from one end of the earth to the other.

POLYMETIS.

The whole distribution of the waters, and the dry land, though it may seem rude and undesign'd to a careless view, is admirably well adjusted to the uses and conveniences of the world. In the first place, the distribution is so well made, that there is a just equipoise of the whole globe. In the next place, the earth and the waters are so admirably well placed about the globe, as to be helpful to each other, and to minister to one another's uses. The great oceans, and the lesser seas and lakes are so extremely well distributed, as to afford sufficient vapors for clouds and rain, to temperate the cold of the northern frozen air, to mitigate the heats of the torrid zone, and to refresh the earth with fertile showers.

SOPHRONIUS.

What a wonderful instance of contrivance it is, that all the rivers on the

face of the earth, in whatever part they arise, discharge themselves at last into the sea; otherwise, vast as the ocean is, it could not have supplied vapors enough to form clouds and rain for watering the whole earth, but would have been soon exhausted. It has been found by calculation, that from the Mediterranean only, which is but a very small sea compared to some others, there may be raised in vapors, in a summer's day, no less than five thousand two hundred and eighty millions of tons of water! What inconceivable quantities must then be raised from the whole surface of the seas in general!

PARMENIO.

While you are speaking of the great use of the clouds and vapors for supplying us with rain, I wish you would explain the manner in which natural philosophers account for the formation of clouds and rain.

POLYMETIS.

Your curiosity, Parmenio, is laudable, and either Sophronius or I shall endeavour to gratify it.

SOPHRONIUS.

There is none, Polymetis, more equal to the task than yourself.

POLYMETIS.

Clouds and rain then are made of vapors raised from water, or moisture only. Those vapors are demonstratively nothing else than small bubbles, or bladders, detached from the waters by the power of the sun, or a subterraneous heat, or both; and being lighter than the atmosphere, are buoyed up by it, until they become of an equal weight with it, in some of its regions aloft in the air, or nearer the earth; in which those vapors are formed into clouds, rain, snow, hail, lightning, dew, mists, and other meteors.

In this formation of meteors, the grand agent is cold, which commonly, if not

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always,

always, occupies the superior regions of the air; as is manifest from the summits of high mountains, which are always covered with snow and ice.

This cold, if it approaches near the earth, precipitates the vapors, either in dews; or if the vapors ascend in greater quantity, and soon meet with cold, they are then condensed into mizzling, or else into showers of small rain. If the vapors are not only copious, but of an equal weight with the lower air itself, they become visible, swim at a little height above the earth, and make what we call a mist or fog. But if they are a degree lighter, so as to mount higher, not however to any great height, and neither meet with cold enough to condense them, nor wind to dissipate them, they then form a heavy, thick, dark sky, lasting often for several weeks, without either sun or rain. In this case, it is scarcely ever known to rain, till it has been first fair weather.

PARMENIO.

PARMENIO.

What you say corresponds with a remark which I have frequently heard made; but pray how do you account for it?

POLYMETIS.

The case is easily accounted for, and it is thus: Whilst the vapors remain in the same state, the weather does so too; and such weather is generally attended with moderate warmth, with little or no wind to disturb the vapors, and a heavy atmosphere to support them; the barometer being then commonly high. But when the cold approaches, and by condensing drives the vapors into clouds or drops, then is way made for the beams of the sun, till the same vapors, being by farther condensation formed into rain, fall down in drops.

The approach of the cold towards the vapors, and consequently the alteration of such dark weather, is often perceived
before

before hand, by some few small drops of rain, hail, or snow, now and then falling : which probably happens from the cold meeting some of the straggling vapors, or the uppermost of them, and condensing them into drops, before it reaches the main body of the vapors below, and exerts itself upon them.

PARMENIO.

The clouds then are a vast heap of vapors exhaled from sea and land ?

POLYMETIS.

They are so, and are raised to that height in the air, where they become of equal weight or gravity with it. In those parts therefore they float, and by striking against one another, and coalescing, they become more dense and weighty. The thinner or rarer the clouds are, the higher they soar; but the more dense or weighty they are, they hover nearer to the earth. The height at which the clouds fly in the atmosphere, is from about a quarter of a mile to a mile.

PARMENIO.

PARMENIO,

But whence proceeds the wonderful variety in the colours of the clouds, and the multiplicity of figures which they assume?

POLYMETIS.

The variety in the colours of the clouds is owing to their particular situation with respect to the sun, and the different reflections of his light: and as to their figure, it results from their loose and volatile texture, revolving into any form, according to the force of the winds. When various heaps of clouds are driven together by the agitation of the winds, they mix, and run into one body, and thus dissolve or condense each other into their former substance of water. The coldness of the air likewise is a powerful means to compact and condense clouds into water.

PARMENIO.

Give me leave now to ask you the manner in which snow and hail are produced.

POLYMETIS.

POLYMETIS.

Snow is produced thus: When the vapors are become considerably condensed, yet not so far as to be liquified, or dissolved into water, then by a special degree of coldness in the upper air, the particles of condensed vapors are compelled into a glacial substance, several of which adhering together, form little white fleeces, somewhat heavier than the air, and therefore descend in a slow and gentle manner.

In respect of hail, it is generated in this manner: when the cloud which rains is very high in the air, or when all the regions of the air are very cold, the falling drops of water are congealed, and grow into an icy substance, of different size and figure, according to the particles of water, the degrees of temperature, the wind, and other circumstances.

The manner how vapors are precipitated by the cold, and reduced into drops, is conceived to be thus: Vapors being
no

other than inflated bladders of water, when they meet with an air colder than what is contained in them, the contained air is reduced into a less space, and the watery shell or case rendered by that means thicker, so as to become heavier than the air by which they are buoyed up, and consequently must needs fall down. Many of those thickened bladders likewise run into one, and so form drops, greater or smaller, according to the quantity of vapors collected together.

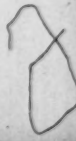
PARMENIO.

It appears that the air is a universal and important agent in all the phenomena of the clouds.

POLYMETIS.

It is indeed both, Parmenio; and not more in the clouds, than on the face of the earth, and in the waters.

DIALOGUE



DIALOGUE X.

POLYMETIS.

YOU say well, Sophronius, that new wonders still arise around us, and every thing declares itself the workmanship of the Most High. What a matter of astonishment, what a subject of veneration towards the Great Maker of the world, is the common Air we breathe! In vain had the earth and waters been spread abroad, in vain had they been adorned with so many admirable properties, had not the infinitely wise Creator provided, and distributed every where that fine fluid which we call the air, to excite, give life to, and maintain the whole world. It is this, however common, and however little taken notice of, that preserves the health and strength of the whole animal creation,

aquatic

aquatic as well as terrestrial; and not only of animals, but of vegetables, from the lofty cedar to the humblest blade of grass that exists on the surface of the globe. Without this useful element, most animals can scarcely live half a minute; and others that are the most accustomed to the want of it, cannot live without it many days. That this a fact, is proved to ocular demonstration by the Air-pump.

It has been found by repeated experiments, that animals whose hearts have two ventricles and no *foramen ovale*, as birds, dogs, cats, rats, mice, &c. when put into a Receiver, from which the air is exhausted, die in less than half a minute, reckoning from the very first exsuction, especially in a small Receiver.

PARMENIO.

I should think that a mole, from its manner of life under ground, would live longer in an exhausted Receiver than any other quadruped.

POLYMETIS.

POLYMETIS.

The idea is plausible, and the same opinion was entertained by the ingenious philosopher who made the experiments just now mentioned: but he found that a mole died in one minute, without recovery, in a large Receiver, and doubtless would hardly have survived half a minute in a small one. A bat, though wounded, sustained the pump two minutes, and revived upon the re-admission of the air. It afterwards remained four minutes and a half in the exhausted Receiver, and again revived. Being subjected to a third experiment, after it had been five minutes in the Receiver, it continued gasping for a time; and after twenty minutes the air was re-admitted, but the bat revived no more.

In respect of insects; wasps, bees, hornets, grasshoppers and lady-cows, seemed to be dead in two minutes, and were kept *in vacuo* twenty-four hours; notwithstanding

ing which they revived in the open air, in the space of two or three hours.

Snails bear the air pump surprisingly, particularly those in shells. Two of those lay in the Receiver above twenty-four hours, and seemed not much affected. After a second exhaustion, the same snails were left in the Receiver twenty-eight hours more; when one of them was quite dead, but the other revived.

Frogs and toads likewise bear the air-pump a long time, especially the former. A large toad sustained the situation almost six hours; within which time, however, it died irrecoverable. Another toad and a frog were put into the Receiver together: the toad was seemingly dead in two hours, but the frog just alive. After they had remained eleven hours, the frog recovered in the open air, apparently weak; but the toad was quite dead. The same frog being put in again for twenty-seven hours, was then likewise quite dead.

The animalcules in pepper water remained *in vacuo* twenty-four hours. After they had been exposed a day or two in the open air, some of them were found dead, and some alive.

SOPHRONIUS.

I have been witness to several experiments of a similar nature, which are all demonstrative of the indispensable necessity of the air for the support of animal life; and that the air is the principal cause of the vegetation of plants, is likewise proved by the same engine.

PARMENIO.

I clearly recollect one remarkable instance to that purpose. A few lettuce seeds being sown upon earth in the open air, and others at the same time upon earth placed in the Receiver, which was afterwards exhausted, the seed exposed to the air was grown up an inch and a half high in the space of eight days; but that in the exhausted Receiver not at all.

Air

Air being again admitted into the Receiver, to see whether any of the seeds would then come up, in the space of one week it grew up to the height of two or three inches.

PARMENIO.

I have likewise seen some experiments made with animals by means of the air-pump; it is surprising how the creatures swell in the exhausted Receiver.

SOPHRONIUS.

Yes, that is occasioned by the air within the body expanding itself, when the pressure of the external air is removed.

POLYMETIS.

We see then the necessity of air for the support both of animal and vegetable life; and it is amazing to consider the weight which bodies sustain from this element.—The height of the atmosphere reaches above forty-four miles, so that the weight of air pressing upon the body

of a man six foot high, is equal to twenty-eight thousand pounds or upwards.

PARMENIO.

How is it then that we constantly support so enormous a weight, without being crushed to pieces?

POLYMETIS.

It is by an internal air, placed by the Creator in all bodies, which, though in so small a quantity as to appear insignificant, is yet sufficient to counterbalance the prodigious weight of the incumbent atmosphere. What but the hand of God could establish so wonderful a balance? It is by this equilibrium of the internal and external air, that we are rendered quite insensible of so immense a weight, and move about as if we sustained not the smallest pressure from the atmosphere.

PARMENIO.

You have clearly shewn the fatal effects resulting to bodies from a removal of the

the external air; I presume that the removal of their internal air would prove equally prejudicial.

POLY-METIS.

You conjecture right; for if the internal air is extracted from any animal, the external air will squeeze the animal flat, and press it to death. By a flat empty bottle laid on its side, it will appear evidently that it is the air within the bottle, whether it be stopped or not, which counterbalances the external pressure of the air, and thereby keeps the bottle from being broke; for by applying a syringe to the mouth of the bottle, and extracting the air within it, this is no sooner done, than the pressure of the external air breaks the bottle into a thousand pieces.—Thus let a globe, or hollow ball of brass, be divided exactly into two equal parts; the edges being made smooth, let them be put together, without any cement, and the air within them be extracted by means of a cock;

the external air will immediately press them so close together, that it will require a fifteen pound weight for every square inch of their circumference, to pull them asunder.

The force of the internal air in bodies is no less powerful; for when the external is taken away, it has been found that the former will, by the mere force of its spring, dilate itself into thirteen thousand times the space which it occupied under the pressure of the atmosphere. If a strong glass bottle, closely sealed up, is put under the Receiver, and the air exhausted, the air within the bottle will expand itself with so much force, as to break the bottle into a thousand pieces: if, instead of a bottle, we put an animal, the internal air in its body will dilate itself to such a degree, as to make it swell till it bursts.

SOPHRONIUS.

By means of these experiments, some of the terrible effects of lightning are accounted

counted for. There have often been instances of men and cattle being killed by lightning, without the least mark or hurt visible on any part of their bodies. This is supposed to be occasioned by the lightning's rarefying or taking off the pressure of the external air so much, that the air within their bodies expands itself with a force sufficient to burst the interior blood vessels, &c. whence immediate death ensues, without any outward signs of injury.

POLYMETIS.

It is the expansive property of this admirable fluid which is the cause of all sounds. This is proved beyond a doubt, by putting a bell under the Receiver of an air-pump. By shaking it before the air is exhausted from the Receiver, it may be made to sound, and heard at a considerable distance; but when the air is exhausted, the bell can scarcely be heard at the nearest distance. If, instead of exhausting the air, a greater quantity of

it be compressed into the Receiver, the bell will sound louder and louder, in proportion to the density of the fluid.

SOPHRONIUS.

The vast swiftness with which sound flies is likewise highly worthy of observation, being fifty-two times greater than that of a brisk wind, or current of air. It is by this property rendered of much greater use to us than if its motion had been slower. Sound, by experiments which have been repeatedly made, is known to fly no less than one thousand one hundred and forty-two feet in one second of time; and whether the sound be loud or languid, whether of bells, guns, &c. great or small, or any other sonorous body, it constantly flies with the same extraordinary swiftness; passing over the last mile with as much velocity as it did the first. Neither do the differences of day or night, summer or winter, heat or cold, cloudy or clear weather, a heavy or light air, make any alteration

teration in the swiftness of its progress, though it is more or less loud at a distance, according as the wind is with it or against it, and that in proportion to the strength of the wind.

It is so obvious, as scarcely to need mentioning, that the velocity with which sound flies is of very great service to us on many occasions. How often have we occasion to call those to our immediate aid who are at a distance? Were then the motion of sound slow, we should perish before they would know that we wanted their help. How much inconvenience, what delay, what loss of time would have arisen, had the motion of sound been slow, even in calling to any of our family out of one room or part of a house to another? We should have been either obliged to have gone to each other for every thing we wanted to communicate, or have lost a great part of our time in waiting while the sound of our voice reached them, and their's returned to us again.

This

This property of the air, as well as every object which we have hitherto considered, proves that the world, and all things in it, were made by a Being, wise beyond our utmost conception; who beheld at one view, in his all comprehensive mind, every particular which would conduce to the interest or pleasure of the inhabitants whom he intended to place in the world.

POLYMETIS.

These properties of the air are indeed wonderful, but there is still more subject for our admiration. It deserves to be remarked, that though the air is a fluid, yet it cannot, by the most excessive cold, be congealed or frozen like water. Were it in any manner capable of such a change, it would prove fatal to every creature on the earth. What a manifest instance is it then of design and contrivance, that though it has every other property of a fluid, yet it should be without this one? Besides the many other uses
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of air, it is absolutely necessary to fire and flame: for a candle or live coal will instantly go out in the exhausted Receiver.

There is still another very great use of air, equal to any we have mentioned, except that of sustaining life itself. It is owing to the air that we enjoy light all around us: for were it not that the rays of the sun are reflected back to our eyes from every part of the particles of the air, the heavens by day would have the appearance of night. The sun indeed would appear a great light in that part of the dark firmament where it was; but whenever we turned our face the contrary way, darkness would surround us even at noon. The air has not only the power of reflecting the rays of the sun, but likewise of refracting them, or turning them out of a direct line, and bending them towards the earth; so that those rays which would in their course pass directly through the sky, and be of no service to us, are by this power of the air turned towards the earth. It is by this means that we enjoy a considerable

siderable degree of light, before the sun rises, and after he sets; which we call the twilight.

Were it not for this, the moment that the sun set, we should be in total darkness, and a cloudy night would then present us with the blackest darkness possible. Still more injurious to us would be the rising of the sun: for if after the pitchy darkness of the night, the day was to break in suddenly upon us, in the full strength and power of its brightness, the tender organs of sight might be hurt by such excessive splendor, so suddenly communicated: or if not prejudicial, it would at least be very inconvenient and unpleasant.

PARMENIO.

Of every thing that has been mentioned, the weight of the air sustained by our bodies most surprises me: but pray, by what means is the weight of the air ascertained?

POLYMETIS.

A method has been discovered of weighing air in a balance, as we do other bodies.

bodies. A Florence flask, with a valve fitted on the top, is exhausted under the Receiver, and while empty, it is equi-poised with weights in a fine balance. Then lifting up the valve, the air re-enters the flask, and by its weight carries it down. The number of grains put into the other scale, to restore the equilibrium, is the weight of the air which fills the bottle. This we find to be nearly eight grains for a pint.

PARMENIO.

But how do you determine the weight of the body of air, incumbent, we shall suppose, upon a square foot?

POLYMETIS.

In this manner, Parmenio. Let a glass tube, of a square form, exactly a square inch area in the bore, and about thirty-three inches long, one end of which has been closed up at the glass-house, so that not the finest spirit can get through it, be filled at the other end quite full with very
pure

pure mercury or quicksilver: when thus full, let it be inverted, with the open end (by which it was filled) stopped, into a wide basin of mercury. Then that end being again opened, the mercury will fall down from the top of the tube into the basin, till it is only twenty-nine inches high in the tube; where it will stop, and descend no lower, notwithstanding the weight of the mercury. The reason why the mercury falls no lower evidently is, that it is kept up by the weight of the air which presses upon the mercury in the basin. This, not being counterbalanced by any air in the tube, keeps suspended a quantity of mercury equal in weight to itself, in order to preserve an equilibrium. That such is really the case, appears by experiment: for the air which presses upon the mercury in the basin, being exhausted by the air pump, all the mercury in the tube will then fall down into the basin. Or, if you open the upper end of the tube, which was before closed up, or hermetically sealed, the air rushing in,
and

and pressing upon the quicksilver in the tube, it will all fall down into the basen; because the weight of the air coming into the tube, joined to the weight of the quicksilver, is double the weight of the air which presses upon the mercury in the basen.

Hence it is plain, that a column of air, of the same base as the tube, viz. one square inch, and which reaches from the earth to the sky, or the highest regions of the air, is equal in weight to twenty-nine square inches of mercury, which is about fourteen pounds. Now, as there is one hundred and forty-four inches in a square foot, consequently the weight of the air pressing upon the surface of it, or a column of air of the same base, viz. one square foot, must weigh a hundred and forty-four times fourteen pounds, which is two thousand and sixteen pounds.

PARMENIO.

I conceive it clearly. Then if we allow fourteen and a half square feet upon the
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the surface of a middle sized man, it will follow, that such a man sustains a pressure of air equal to fourteen times and a half two thousand and sixteen pounds, or nearly thirty thousand pounds.

POLYMETIS.

Your inference is perfectly just.

PARMENIO.

The manner in which you have shewn the weight of the air, explains likewise the principle on which barometers act.

POLYMETIS.

They do act on the same principle. And as in the different changes of the weather, the air is sometimes heavier, sometimes lighter, consequently the quicksilver in the tube must, exactly like a weight in a scale, either rise or fall, or sometimes be stationary. In rainy weather the air is lightest, consequently the quicksilver falls: on the contrary, the air being heaviest in fair weather, the quicksilver rises accordingly; so that if
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the barometer is well made, it may be depended on for foretelling the changes of weather. Only it must be remembered, that the weather-glass will rise or fall sometimes several days before there happens any visible alteration of the weather. High winds will likewise make some alterations in it.

PARMENIO.

But might not a barometer be constructed with any other fluid as well as mercury?

POLYMETIS.

Certainly it is not owing to any peculiar property in the quicksilver that it stands in the tube at the height of twenty-nine inches, correspondent to the weight of the air at the time. The same thing will happen with water, with this only difference, that the tube in which we put the water, to try this experiment, must be about forty feet long; and the water will stand in it at the height of about thirty-

two feet; which is occasioned by water being so much lighter than quicksilver: for it is found, that twenty-nine inches height of mercury in a tube of equal diameter, is equivalent to a column of thirty-two feet of water.

The weight of the air is a property from which we derive some of the greatest advantages in life. Thence, in particular, are deduced the invention and construction of the most useful engines and machines employed in all kinds of fire and water works. Thence likewise arises the use and power of that most commodious engine the pump, which is said to have been invented by Clesebes, a mathematician of Alexandria, about a hundred and twenty years before Christ.

It is by the pressure of the air, that the water in reservoirs is impelled into the conduit-pipes, and carried to any house, or other place, below the horizontal level of the surface of the water in the reservoir or fountain, be the distance what it may.

The

The fire rarefying and attenuating the air in the chimneys, causes it to ascend the funnel, while the air in the room, by the pressure of the atmosphere, is forced to supply the vacancy, rushes into the chimney in a constant current, excites the fire to burn in the stoves, and buoys up the smoke aloft in the superior air.

Even that common utensil the Bellows, acts on no other principle than the pressure of the air: for the upper part being lifted up, raises the column of air off the bottom part, and thus making a vacuum, the air rushes in through the hole in the lower part; when being compressed by forcing down the upper, it shuts close the valve within, and is protruded with great force through the pipe or nose of the bellows.

But the most important of all the effects arising from the gravity of the air is yet to be mentioned; and that is, its being the immediate instrument of animal life, by the means of inspiration and expiration. For in the dilatation of the thorax, the air,

by the pressure of the atmosphere, is forced into the cavity of the lungs, which it no sooner distends, than it is again expelled by the contraction of the muscles. — Without the pressure of the air, this alternate action of the lungs could not be maintained : and hence it is, that on the top of high mountains, where the air is thin, and its pressure greatly diminished, people experience a difficulty of respiration.

It is likewise entirely owing to this property of the air, that infants can receive their food from their mother's breasts. For the child, in sucking, draws away the air from about the orifices of the nipple, and the air at the same time pressing upon the surface of the breast, forces the milk to spring out plentifully in that part. The case is the same with all other sucking creatures.

Many other vast benefits do we receive from the air, both as a vehicle and a substance; but we must defer the consideration of these to some other opportunity.

DIALOGUE XI.

POLYMETIS.

WE have already considered some of the most amazing wonders of the earth, the waters, and the air: there is still another appendage of our habitation which, I think, you will allow is no less common, no less unheeded, and yet no less useful and wonderful than the air itself, and that is Light: for without it, what benefit, what comfort, could we have enjoyed from our existence? How could we have provided ourselves with food and necessaries? How could we have gone about the least business, corresponded with one another, been of any use in the world, or other creatures of any to us, without light, and those admirable organs of the

K 3 body,

body, which the Great Creator has adapted to the reception of it?

SOPHRONIUS.

And besides, as the same grand luminary which affords us light is likewise the dispenser of heat, all nature must have languished in intolerable cold, as well as darkness.

POLYMETIS.

Yes, the world must have been made in vain without the appointment of the sun ; and even the sun created to no purpose, without the peculiar laws by which his administration is regulated. The same infinite wisdom was no less necessary to endow light with just such properties as would render it of use to us, than to form the air exactly of such a proper consistence, as should serve for the purpose of respiration. For if we consider that the sun, the fountain of light, is near eighty-six millions of miles from us, we may well conceive that in vain would it have emitted

ted its light and heat, for any use it would have been of to us, had not the wisdom and hand of God disposed light to pass or fly with the most amazing velocity. We esteem a ball shot out of the mouth of a cannon, to fly with prodigious celerity, but light flies a million of times faster; and it not only flies thus amazingly swift, but reaches to an inconceivable distance, even to the farthest bounds of the universe; which is so vast as to exceed the comprehension of man's understanding.

PARMENIO.

In what time is it computed that the light passes from the sun to the earth?

POLYMETIS.

In about seven or eight minutes; and that through a space nearly of eighty-six millions of miles!

PARMENIO.

Astonishing! Now that you are speaking of the sun, what kind of a body do

K 4

you

you really suppose it to be? Some of the ancient philosophers entertained whimsical opinions on this subject. One of them imagined it to be a great stone intensely heated; and another, that it was a large plate of iron made red-hot in the fire.

POLYMETIS.

Such ideas were suitable to the infant state of the human mind, when vague conjecture supplied the place of investigation. But rational theory assures us, that the sun is a body of fire: and what still further proves, that some divine and infinitely wise agent formed the light, and endowed it with all such properties as might render it beneficial, and preserve it from being hurtful, is, that the rays of such a body of intense fire, coming down to us as close together as they at first issue from the sun, would set the whole earth on fire, and melt it with fervent heat. Of this we may be convinced, by the effects which we find arise from collecting together

together even so few rays as fall within the compass of three or four inches: for we see that these will set paper, tobacco, and many other things on fire. What we call burning-glasses have no other property to increase the heat of the sun, but only by collecting several of its rays together: and there are burning-glasses of a larger size, that will immediately melt lead and pewter of a considerable thickness, set wood on fire in an instant, reduce into a state of fusion in a very short time, brass, copper, and even iron-plates, which require a great while to be effected in the hottest melting furnace.

From this prodigious degree of heat, far exceeding any thing on earth, which is produced by uniting those rays of the sun only which fall in the compass of a few feet, we may judge what terrible effects they would have produced, had they descended from the sun in such a united manner. But the wise Creator ordained, that its rays of light and heat, the instant they issued from its body, should

should scatter and diverge from each other, and continually more and more so, the farther they proceed in right lines; by which its heat, which would otherwise have destroyed all things, is rendered of so temperate a nature as to cherish and nourish them. Are these things not so, Sophronius?

SOPHRONIUS.

Most certainly they are. It was necessary that light should fly with prodigious swiftness, otherwise its influence would have been of little or no benefit to us. It was necessary that its particles should be exceedingly small, otherwise it would have broke almost every thing in pieces. It was necessary that its rays should continually separate and diverge in their passage, otherwise it would have set the whole earth on fire. Light has likewise two other properties, which are of the greatest service to us, viz. that its rays are capable of being refracted or turned out of their course, in passing from one medium to another, as from air into water

or

or glass; and that great part of it likewise is reflected back from almost all bodies.

PARMENIO.

The body of the sun must be of a prodigious magnitude.

POLYMETIS.

It is computed to contain near ten millions of times a greater quantity of matter than the whole earth! Who can consider it, and not be astonished? But it is not only the immense power of God in making the sun, that we ought to adore and admire, but likewise his wisdom and goodness in placing it at just such a due distance as is suitable to the nature of our earth. Had we been placed much nearer the sun, our world would have been burnt up, the waters would have been turned into vapors, and wasted; vegetation would have ceased, and all things would have been consumed. On the contrary, had we been stationed at a much greater distance, all things must have been frozen up in extreme and perpetual cold. Thus

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it is manifest how wisely and indulgently the great Creator has provided for the good of our earth, by so critically adjusting the distance of the sun to the exigencies and benefit of the various departments of nature.

PARMENIO.

The philosophical observations you have made on light, induce me to request that you would extend them to that admirable organ the eye, with which it is intimately connected. I am not so deeply versed in optics as to be master of that subject; but I know that both you and Sophronius can develope it with scientific precision. Fortunately for such as me, there is not over the door of your Library the inscription which a celebrated ancient placed over the entrance of his school: "Let none enter here who is not initiated in science."

POLYMETIS.

You are always happy in suggesting a subject for contemplation. Nothing can
more.

more properly succeed light than the theory of vision. Let us therefore consider what for its excellence has been called the miracle of the Creator; who has displayed the strongest marks of his stupendous power and wisdom in the beautiful structure of the Eye.

As light is designed to enter the eye, the formation of that organ is entirely accommodated to the nature of light; and vision is performed by the rays of light reflected from an object on a fine membrane, called the retina, placed at the bottom of the eye. In order, however, to make light the means of vision, there was required a most wonderful contrivance in the eye: for it being a property of the rays of light, that they separate from each other the moment they come from any body, and diverge still farther and farther, in proportion to their progress, they are naturally of no service to enable us to see objects: for they must be collected again, and brought into one point, before they can form the image of any object.

Now,

Now, we know that the humors of the eye are particularly suited to this purpose of drawing together the rays of light. When these first enter the eye, they meet with a thin humor, called the aqueous or watery humor, because it is in all respects like water, except that it will not freeze in the greatest cold. In passing through this humor, such is the property of it, the rays of light are turned out of the course in which they were proceeding, and are brought nearer together, till they come to the second humor of the eye, called the crystalline humor, which is a transparent solid substance, convex outwards on both sides, and which unites all the rays in the bottom of the eye.

To illustrate the subject by a simile, we find that a flat piece of glass has no power to unite the rays of light; but if the same glass is ground convex, in the manner of spectacles, it will gather them into one certain point, and delineate exactly the images of all objects before it. This may be exemplified by the *camera obscura*;
darkening

darkening any chamber that has a prospect, and cutting a hole through the window-shutter, or whatever supplies its place, something smaller than the diameter of a spectacle-glass: then place the glass exactly before and close to the hole; taking care that the light has no other passage into the room. If you now hang a white cloth or paper at a proper distance from the glass, so that the rays which proceed from every point of the objects may each of them be collected into its correspondent point, you will perceive that the images of all the objects in the front of the chamber will be painted in the most exact manner upon the cloth or paper, according to all its lineaments and colours, especially if the sun happens to shine upon the external objects, and the glass be in the shade. It will be necessary to move the paper nearer to or farther from the window, till it be brought to the exact distance where the rays of light meet in a point. This experiment is very easy,

and

and exactly explains the manner in which vision is performed.

From this view of the subject, we may understand how many circumstances were necessary to render the eye capable of seeing and distinguishing objects. Thus we find in the dark chamber, that a flat piece of glass will not answer the purpose, and that the moment the convex or spectacle glass is removed from the hole, no distinct objects appear upon the paper or cloth. In the same manner, had the eye been made flat instead of convex, or had it not contained that double convex substance, called the crystalline humor, though the eye had remained the same in all other respects, yet it could not have distinguished any object distinctly. To preserve this convexity of the eye, so necessary to sight, God not only made the eye of a convex form at first, but placed it in that clear transparent fluid, called the aqueous or watery humour; which besides refracting or bringing together the rays of light, protrudes the external
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membrane of the eye, and makes it of a convex form. And this humor being so indispensable, such a provision is made, that if by any accident of a wound or puncture of the eye, it is entirely evacuated, nature gradually supplies it again, after an interval of some time.

In the decline of life, the aqueous humor is less copious, and the eye becomes flattish; when having no longer the power to draw the rays of light together, sufficiently to form a distinct and perfect image, it becomes necessary to use spectacles, the convexity of which supplies the defect.

It was not only necessary that the eye should be convex, but that it should be so only to a certain degree: for if it is too convex, it gathers the rays of light together into a point too soon, or before they reach the retina, and consequently can either form no image there, or a very indistinct one. This is the case with people who are *near sighted*; a defect which is to be remedied by using glasses ground con-

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cave

cave or hollow on the inside, so as to compensate the too great convexity of the eye.

It is particularly worthy of remark, that though every other part of the body grows continually and proportionably from infancy to manhood, yet the crystalline humor of the eye preserves the same size and form both in adults and children.

In the *camera obscura*, or dark chamber, if the hole we cut for the glass is too small to admit a sufficient number of rays, the images will be represented upon the paper very faint and imperfect: on the contrary, if the hole be so large as to admit too much light, the images will be still more weak and imperfect. Thus we see what a nice and just proportion was necessary in the formation of the pupil or hole of the eye, which admits the rays of light. Had this only been either a little too large or too small, the defect would have rendered the curious structure of the eye almost totally useless. We find that the pupil of the eye is not only formed of that precise dimension which is the fittest
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for sight, but, which is matter of still greater admiration, that as we have occasion to view objects, sometimes in a greater, sometimes in a lesser light, it spontaneously becomes larger or smaller, in order to admit more or fewer rays, according as will best serve our sight. If the light is too much, it presently contracts, to exclude what is superfluous; but if the light is too faint, or the object we look at is distant, it dilates, or becomes larger, for the purpose of admitting a greater number of rays.

It deserves our particular notice, that the pupil is of different forms, in different animals, according to their respective occasions. In some, as in man, it is round; that being the most proper figure for the position of our eyes, and the use we make of them both by day and night. In some other animals it is of a longish form; in some it is transverse, with a large aperture, such as in cattle, sheep, horses, goats, &c. This is an admirable provision for those creatures to see the better

laterally, and avoid inconveniences, as well as to help them to gather their food on the ground, both by day and night. In other animals, particularly the nocturnal, the fissure of the pupil is erect, capable both of opening wide and shutting up close: the latter serving to exclude the brighter light of day, and the former to take in the more faint rays of the night; thereby enabling them to catch their prey with the greater facility in the dark, to see upwards and downwards, to climb, &c. Thus cats, their pupils being erect, and the shutting their eye-lids performed transversely, can so close the pupil, as to admit of, as it were, only one single ray of light; and by throwing all open, they can take in all the faintest rays; an incomparable provision for those animals which have occasion to watch and way-lay their prey both by day and night.

Besides this large opening of the pupil, there is, in some nocturnal animals, another admirable provision, which enables them to catch their prey in the dark. It is

is a radiation or shining of the retina at the bottom of the eye. This is most remarkable in cats, but exists not either in man, birds, or fishes. To cats it is highly serviceable, both for our use and their own benefit, by enabling them to catch and destroy those animals which are noxious to us, and food to them, and seldom stir out of their holes till the night-time.

SOPHRONIUS.

The account of vision with which you have favoured us is extremely distinct, but, if I am not mistaken, you have omitted——

POLYMETIS.

The vitreous humor?

SOPHRONIUS.

That is what I mean.

POLYMETIS.

You are perfectly accurate in observing that I have not mentioned that hu-

mor; but I had deferred it, perhaps indeed improperly, till I should advert to the shape of the eye. I shall now proceed to notice it. But let me first observe, that to enumerate all the wonders of the eye, would require a large volume; for every part of it bears the mark of amazing wisdom and contrivance.

The form of the eye is not less worthy of attention than any hitherto mentioned: for if, instead of being spherical or roundish, it had been a plain superficies; it could not have received the image of any object larger than itself; but by means of its sphericity or roundish figure, the eye, though small, can receive the image of the greatest bodies, and even of almost the fourth part of the heavens at one glance. To preserve this spherical figure of the eye, there is provided another humor, called the vitreous or glassy humor: it is very clear and bright, resembling much the white of an egg, and is in greater abundance than either of the other humors. It is placed behind the crystalline

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humor,

humor, and fills the whole cavity or dark chamber of the eye. To this it is owing, that the eye is of a spherical form. It also serves to keep the crystalline humor at a proper distance from the retina, which receives the images of objects.

SOPHRONIUS.

Is it not admirable to behold how very fine all the coats or membranes of the eye are, and yet of so firm a texture, as to be able to contain so many different humors, and to perform so many different actions, without scarce ever being injured by so constant use?—So careful has the Creator been, that his creatures should enjoy this excellent and useful sense, no animal has less than two eyes, each of which single can perform all the offices of vision, that in case one is by any accident injured or lost, the other might supply its place. But with regard to the number of our eyes, there is a very wonderful circumstance, which men the most skilful in optics are unable to account

for; and it is this, that though the image of every object is actually pictured on the retina of each eye, whilst we have two, yet we do not see the object double, but just the same as if we were to look at it only with one eye. This a strong proof of the infinite skill, and the exquisite art employed by him that made the eye: for what confusion should we have been always in, what inconveniences should we have experienced, had all objects been seen double?

POLYMETIS.

Another thing observable with regard to the eye, besides its advantageous situation in the head, the most eminent part of the body, is its being placed in the fore-part, or side-part of it, according to the particular occasions of different animals. In man, and some other creatures, it is placed to look directly forward chiefly; but so accommodated as to take in the greater part of the hemisphere before it. In birds, and some other creatures, the eyes

are seated in such a manner, as to take in almost a whole sphere, that they may be the better enabled to seek their food, and escape dangers. In some creatures they are placed so as to see best behind them, or on each side; by which means they may avoid any enemy that pursues that way. Thus, in hares and conies, the eyes are very protuberant, and placed so much towards the sides of their head, that their two eyes take in nearly a whole sphere; whereas in dogs, that pursue them, the eyes are set more forward in the head, to look that way more than backward.

The scriptures teach us, that God's care and wisdom is over all his works, the meanest and most minute, as well as the greatest; and the wonderful contrivance which appears in the provision made for the sight of the meanest creature, to suit its particular circumstances, may convince us of this truth as much as any thing. Thus snails, not being able to turn their head quick from side to side, their eyes are not placed in their head, but

but at the end of their long horns, which they twist and turn about on every side, with great ease and agility.

Spiders being to live by catching so nimble a prey as a fly is, it was necessary that they should see every way, and take it by a sudden spring, as they do, without any motion of the head, which would have scared away so timorous an insect. Accordingly we find that spiders have no neck, so that they cannot move their head; but they are furnished some with four, and others with six, seven, or eight transparent eyes, placed in the front of their head.

SOPHRONIUS,

There seems to have been the like consideration had to the pleasure and benefit of the mole, in the structure of its eye. For as the habitation of that animal is entirely subterraneous, and its lodging, its food, its exercises, nay even all its pastimes and pleasures, in those subterraneous recesses and passages, which its

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own industry has made, so the size of its eye is admirably adapted to answer all its occasions, and at the same time to prevent inconveniences. As a little light will suffice an animal living always under ground, the smallest eye will abundantly supply its exigence; and a protruberant eye like that of other animals, would much annoy it in its principal business of digging for its food and passage; it is endowed with a very small one, commodiously seated in the head, and well fenced and guarded against the annoyances of the earth.

POLYMETIS.

Indeed we invariably find the eye accommodated to the particular circumstances of every creature. It is observed by anatomists, that horses, cattle, sheep, and other animals which feed upon grass and herbs, and are therefore obliged to hang down their heads a great deal in choosng and gathering their food, have a particular muscle to sustain the eye, to prevent

prevent it from being hurt by too much suspension ; which is not to be found either in man or other animals, who have not occasion to hang down their heads so frequently.

SOPHRONIUS.

There is likewise a very curious and extraordinary formation of the eye bestowed on birds and fishes, which enables those creatures to see at all distances, far off or nigh ; and this peculiarity, especially in the waters, requires a different conformation of the eye. In birds also, this is of a great use, to enable them to see their food at their bill's end, or to reach the utmost distances which their high flights enable them to view ; as to see over great tracts of sea or land, whether they have occasion to fly ; or to perceive their food or prey, even small fishes in the waters, and birds, worms, &c. on the earth, when they sit upon trees or high rocks, or are hovering high in the air. A singular conformation may be observed

served in the eye of the cormorant, which is, that the crystalline humor is globous, as in fishes, to enable it to see and pursue its prey under water. It is farther observable, that the eyes of birds, quadrupeds, and fishes, are defended by a membrane, of the nature and hardness of bone or horn, which in man is not to be found; he having little occasion to thrust his head into such places of annoyance, as quadrupeds and other animals; or if he has, he can defend his eyes with his hands. Fishes are destitute of eye-lids, because they have no occasion for a defensive against dust and motes, injurious to the eyes of land-animals, nor to moisten and wipe the eyes, as the eye lids do. The nictitating membrane therefore is a sufficient provision for all their purposes, without the addition of the eye-lids. In respect of creatures whose eyes, like the rest of their body, are tender, and without the guard of bones, they are endowed with a faculty of withdrawing their eyes

into

into their head, and lodging them in the same safety with the body.

POLYMETIS.

In a word, every particular relative to the eye, announces the workmanship of God. In ourselves, we find this elegant and useful organ fenced with strong compact bones, and lodged in a well made socket, where it is defended from the stroke of any flat or broad bodies, and guarded by the eye-lids, which are admirably fitted for this purpose. For they are made of a thin and flexible, but strong skin; by which means they not only guard the eye, but wipe and clean it. Their edges are formed of a soft cartilage, which enables them not only to perform their office better, but to close more easily. Out of these cartilages grows a palisade of stiff hairs, of great use to warn the eye of the invasion of dangers, to keep off motes, to exclude too great light, &c. and likewise to afford at intervals a sufficient passage for objects
to

to approach the eye. It is remarkable, that those hairs grow only to a certain commodious length, and require no cutting, like many other hairs of the body. Their points likewise stand out of the way; in the upper lid bending upwards, and in the lower downwards, that they may be the better adapted to their use. That the outer coat of the eye, which must be pellucid, to transmit the light, may not grow dry and shrink, and thence lose its transparency, the eye-lids are so contrived as often to wink, so that they may supply it with a moisture, contained in some glands, with which they are furnished for that purpose. By the same means, they likewise wipe off whatever dust may stick to the coat of the eye; and this, lest they should hinder the sight, they do with the greatest celerity. Being also made very soft, there is no danger of their hurting the eye.

SOPHRONIUS.

To the many remarks you have made,
I beg leave to add only one. Because
for

for the guidance and direction of the body in walking, and any exercise, it is necessary that the eye should be exposed to the air at all times, and in all weathers, the most beneficent author of nature has provided for it a hot-bed of fat, which fills up the interstices of the muscles, and renders it less sensible of cold than any other part.

POLYMETIS.

Yes, that is a wonderful advantage: for had the aqueous humor been exposed to freeze by cold, like other water, it would both have injured the nice arrangement of the eye, and diverted the rays of light from their due course, in passing through that humor to the pupil.

PARMENIO.

Nothing can be more amazing than the whole structure and economy of the eye.

DIALOGUE XII.

PARMENIO.

AND what most excites my astonishment, is the various modifications in which it exists in different creatures.

POLYMETIS.

I presume you are speaking of instinct; a subject by many little heeded, but to those who think justly, a source of rational entertainment, and even of useful instruction. No instinct implanted by the Author of nature can be unworthy of contemplation.

PARMENIO.

That is the subject of our conversation. I was just observing to Sophronius, that it is chiefly conspicuous in most creatures

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at the season when they bring forth their young. The preservation of the species appears to be the strongest instinct in the animal world; and preparatory to this object, how admirable is the industry and sagacity of birds, in finding out a secret, quiet and secure place for their nests! There is a bird in India, which makes its nest of the fibres of some roots, most curiously interwoven and plaited together, and then hangs it on the ends of twigs of trees, bending over the water, to secure their eggs and young from the apes and monkeys of that country, which would otherwise destroy them.

POLYMETIS.

I have seen such a nest as you describe: it is that of a bird on the Spanish main.

PARMENIO.

When the female of the king-fisher has conceived, she makes her nest of the prickles of the sea-needle, weaving them together in the form of a long fishing-net,
very

very thick and uniform. She then puts it under the dashing of the waters, that being by degrees beaten upon and milled, it may acquire a smooth surface; after which it becomes so solid, that it cannot be easily divided by either stone or iron. What is yet more wonderful, the mouth of the nest is so exactly fitted to the inhabitant, that neither a greater nor a less animal than the king-fisher can live in it. For when she is in it, as is said, it will not admit the sea-water.

The nest of the long-tailed titmouse likewise deserves observation. She builds it most artificially with mosses, hair, and the webs of spiders, cast out from them when they take their flight. She afterwards thatches it upon the top with the *muscus arboreus ramosus*, or such like broad whitish moss, to keep out rain, and to elude the suspicion of any spectator. Within, she lines it with soft feathers, in such quantity, that it is really surprising how so small an apartment could contain them; especially that they could be laid

so close and handsomely together, to afford sufficient room for a creature with so long a tail, and so numerous an issue as it generally has.

POLYMETIS.

The wonderful instinct of incubation, or sitting on their eggs, in birds, cannot be sufficiently admired. For when they are engaged in that business, they will remain in their nests for several weeks, deny themselves the pleasures, and even the necessaries of life: some of them even starving themselves almost, rather than hazard their eggs, to get food; and others either performing the office by turns, or else one of them kindly seeking out, and carrying food to the other, engaged in the office of incubation.

SOPHRONIUS.

It is really a matter of great admiration, to reflect on the wonderful propensity which all creatures have to bring forth their young in safety, the extraordinary
pains

pains and toil which the greater part of them take to provide them food, the arts they make use of, and the courage they exert to defend them! The love of their young renders the most timorous creatures courageous, the most slothful industrious, and the most voracious parsimonious. We know that when partridges and their young are pursued, the old suffer the young to fly away before, so contriving that the fowler may entertain expectations of catching themselves. Thus they hover about, run forward a little, then turn again, and so amuse the fowler, till the young have made their escape.

The bear not only brings forth her young, but finding them shapeless, she fashions them with her tongue, by constant licking.

POLYMETIS.

And the bitch, if her puppies are kept at a distance from the house till they are pretty large, will disgorge for them the food she had picked up in the house,

before it has time to digest in her own stomach.

We daily behold hens, how they cherish their chickens, taking some of them under their spread wings, suffering others to mount upon their backs, and taking them in again with a voice expressing kindness and joy. When themselves only are concerned, they fly from dogs and other creatures; but to defend their chickens, they will not only attack dogs and other animals, but even dare to fly in the face of a man. On the contrary, the fiercest animals will become tame, and as it were cajoling, when they find their young involved in the same danger with themselves. Thus, the lioness, if, when leading her whelps, she should be met by huntsmen in the wood, she at first views them with scorn, but immediately her courage fails her; she is enervated with fear lest her whelps should be wounded, and she drops her head, as it were in intreaty to spare them.

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There is a remarkable particular in birds, with regard to the care of their young; which is, that they never omit instructing them to fly: for the young birds dare not trust themselves to the air, till they are first instructed and brought to it by their parents.

SOPHRONIUS.

Innumerable are the instances of the great care which even insects take of their young. Thus, all of them which do not themselves feed their young, lay their eggs in such places as are most convenient for their exclusion, and where, when hatched, their proper food is ready for them. We see two sorts of white butterflies fastening their eggs to cabbage-leaves, as being fit aliment for the caterpillars that come out of them; whereas, should they affix them to the leaves of a plant improper for their food, those caterpillars must needs be lost, they choosing rather to die than to taste of such plants.

POLYMETIS.

I believe similar instances might be produced in the other tribes of insects: it being common to all, if not prevented, to lay their eggs in places where they are seldom lost or miscarry, and where they may have a supply of nourishment for their young, as soon as they are hatched. Those, in respect of whose young, nature has not made provision for sufficient maintenance, do themselves gather it before-hand, and lay it up in store for them. Thus the bee, the proper food of whose young in the infant state is honey, or what we call bee-bread, neither of which is any where to be found amassed by nature in sufficient quantity for their maintenance, does herself, with unwearied industry, fly from flower to flower, collect and hoard them up.

PARMENIO.

In the same manner, hornets, wasps, and many kinds of flies, carry maggots, spiders,

spiders, &c. into their nests or cells, where they carefully seal them up with their eggs, for the future provision of their young, in their first or maggot-state, when they stand in need of food.

POLYMETIS.

When we seriously consider these, and many other instances which might be mentioned, of the strong affection of brutes to their young, and the remarkable care and sagacity with which they provide every thing necessary for them, we are led to the contemplation of the great Creator of all things: for it can only be some most wise and powerful Being, who could teach brutes every thing necessary for the propagation and preservation of their species. There is such a provision made for even the smallest insect, that whoever observes it, must be convinced, that no creature has been produced by chance, but by that wise, powerful, and intelligent Being, whom we call God; who perfectly knew the nature and wants of every creature, provided

provided for them accordingly, and determined that each species should continue till the earth shall be no more.

The wonderful speedy growth of birds, which are hatched in nests, and fed there by the old ones, till they are fledged, and come almost to their full size, at which they arrive in about a fortnight, seems likewise an argument of Providence; designing by this their security, that they might not lie long in a condition exposed to the havoc of any vermin which might discover their habitation.

SOPHRONIUS.

Indeed all nature abounds with demonstration on this subject. I shall mention only one instance of a bird. It being the nature of the Pelican to build her nest upon high rocks and mountains, in the midst of deserts, where there is no water for many miles, it is furnished with a large bag, under its bill and throat, capacious enough to contain thirty pints; by which it is enabled to carry water sufficient, and
food

food for its young, from a great distance.

—In the same manner, the heron has much larger wings than are necessary for so small a body, that it may be enabled to carry the greater load to its nest at several miles distance, which they frequently do: fish some inches long being often found under the trees in which they build, though many miles from any water.

POLYMETIS.

In quadrupeds, as well as in man, the faculty of suckling the young is an excellent provision, which the Creator has made for their sustenance. Milk is not only the most suitable and agreeable food to young creatures, but they are taught by nature to desire it as soon as they are born; and the most savage animals, so far from withholding it from them, even teach and initiate them in the art of taking it. For supplying this wholesome nutriment, a curious apparatus is provided in the different species of animals, which have a number of breasts, proportionable to their
respective

respective occasions. Thus women have two breasts and nipples, that the child in sucking may be laid sometimes to one, and sometimes to the other; lest its body, from being always laid to suck on one side only, might contract any crookedness. In the elephant, the nipples are placed near the breast; because the old one is forced to suck herself, and by the help of her trunk, conveys the milk into the mouth of her young.

Though these things are generally taken little notice of, they are highly worthy of attention, and may afford matter of entertainment and use, even to the wisest: for to what conclusions do such observations conduct us? Certainly at last to acknowledge, that the Divine Architect is seen as plainly in the lowly moss, as in the lofty cedar of Lebanon: in the almost imperceptible mote as in the huge leviathan; in a grain of sand as in the highest mountain. The Deity may be alike seen in every part of his works by an attentive observer: but objects that are familiar to

us lose their force upon the mind, which yet is struck with those that lie remote from observation. Some who were blind to all the wonders of nature around them, have been convinced of a first cause, upon receiving ocular proof of the circulation of the blood.

DIALOGUE XIII.

PARMENIO.

I wish that a certain Free-thinker had been present at our last conversation; one whom I have heard strenuously arguing in company against the existence of a first cause, and maintaining that every thing in nature was the effect entirely of chance.

POLYMETIS.

Was the man blind, Parmenio?

PARMENIO.

No, he seemed to have the use of his eyes perfectly.

POLYMETIS.

And how did such discourse appear to be relished by the company?

PARMENIO.

PARMENIO.

They heard him with silence, but my back being towards them, I could not perceive whether they listened with marks of attention.

POLYMETIS.

You could judge from his manner of speaking, no doubt, whether he discovered any self-complacency, any signs of vanity or triumph in the shrewdness of his own understanding.

PARMENIO.

He seemed indeed to do so, and that not a little.

POLYMETIS.

Then I am right in my suspicion; there lay the source of his philosophy.

SOPHRONIUS.

I have always thought that a pride in singularity of opinion is generally the motive, more or less latent, of men of that disposition.

POLYMETIS.

POLYMETIS.

I believe it very seldom happens that the case is otherwise. I remember two or three men, at different times, who were much addicted to discourse of that kind. That the universe had existed from eternity, that there was no Providence, that every thing in nature was governed by chance; these were constantly the topics on which they declaimed. I was at that time very young, but endeavoured the best way I could to refute their opinions. I remonstrated against the apparent impossibility that any material system of bodies could have existed from eternity; maintaining that those bodies being of themselves nothing else than inert matter, equally incapable of design or action, they must have been originally the work of some most powerful and immaterial Being, who previously existed, and must have existed from eternity. That therefore they could not be the production of chance; much less could they be preserved

served in systematical order by any such fortuitous principle. That the constant vicissitudes of day and night, the regular succession of the different seasons, the stated changes of the moon, and the periodical revolutions of all the planets, proclaim aloud that those invariable laws can only be enforced by an intelligent Being, whose wisdom is equal to his power, and his goodness to either. That if any additional proof was required, to confirm this doctrine, it might be abundantly supplied by attentive observation to the world we inhabit; where the whole system of nature, in its various departments, the earth, the waters, the air, the light, the animal, the vegetable, and even the fossil kingdoms, all concur in one general declaration, that the Power which made them is divine.

PARMENIO.

Did they make any answer to those arguments?

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POLYMETIS.

POLYMETIS.

They generally did make some reply, but in the form of a question, not of an answer; and it amounted to nothing more than a perseverance in their opinions. After all that I had said, they would ask, "Why may not the universe have existed from eternity?"

SOPHRONIUS.

No arguments can ever avail with men, whose purpose is only contradiction to the general sentiments of mankind. They are for the most part mere Smatterers. I never knew them to draw any argument from their own fund. Having heard of the atheistical notions of some writers otherwise celebrated, or perhaps just looked into their writings, they retail the hackneyed jargon with all the confidence of men whose opinions are founded upon what they think eminent authority.

POLYMETIS.

And what is not more strange than true, those very men, while they affect to deride

ride the belief of others in the doctrines of the Christian religion, though consistent with reason, shall persist in maintaining a whimsical creed of their own, in direct opposition, not only to the conclusions of reason, but even of common sense.

PARMENIO.

Such men are disturbers of society, and seem as much objects of public cognizance as rioters, who are committed to close custody, or the felons who are sent into banishment.

POLYMETIS.

They are indeed objects of reprobation, if not more properly of contempt: but beware of calling them disturbers of society, in their own hearing.

PARMENIO.

Do you imagine that they are extremely susceptible of such reproach?

POLYMETIS.

By no means: but it would gratify them with a notion of their own impor-

tance, which is the object they have principally in view. Call them rather a nuisance to society: such an appellation, by mortifying their pride, may serve to reclaim them from absurdity. It was the opinion of Aristotle, that such men ought to be treated not with arguments, but punishments.

DIALOGUE XIV.

POLYMETIS.

WE have taken a cursory view of the wonders of the earth; shall we indulge speculation a little on those of the firmament?

SOPHRONIUS.

Nothing can be more agreeable to me, and I am persuaded, to Parmenio likewise.

PARMENIO.

So agreeable indeed, that had I been to propose a subject, I should have preferred that to every other.

POLYMETIS.

But to conceive a just notion of them, we must divest ourselves of all those little

ideas we have been used to form of things, and stretch our imagination to the utmost. How astonishing must be the space which affords room for an innumerable multitude of stars, many of them more than a hundred thousand miles in breadth, to perform vast circuits even of several hundred millions of miles! But to form the better judgment of this inconceivable space, let us consider particulars, according to the observations of the most approved astronomers.

It is found that the Moon, though only a satellite of the earth, and her circuit the least of all the celestial bodies, takes up a space of near four hundred and eighty thousand miles in breadth, in which to perform her monthly revolution. As to the Earth where we live, the circuit in which it moves round the Sun every year, is above five hundred millions of miles in circumference. Much larger still is the circuit which some of the stars move through. The planet or star called Saturn moves in a circle, the breadth only

of

of which is a space of more than one thousand five hundred millions of miles. The star called Jupiter moves in another circle, the breadth of which is above eight hundred and forty-eight millions of miles. The star Mars, in one of two hundred and forty-six millions broad. That called Venus, in a circle, the diameter of which is one hundred and eighteen millions. And that of Mercury, in one the breadth of which is sixty four millions of miles.

SOPHRONIUS.

How astonishing such circuits! and likewise the magnitude of the bodies!

POLYMETIS.

Yes, the circumference of the body of Saturn, is above two hundred and thirteen thousand miles; and that of Jupiter, two hundred and fifty-four thousand. The others of inferior dimensions: but that of the Earth is above twenty-five thousand; of Venus, more than twenty-four thousand; of Mars, above thirteen thousand; and of Mercury, seven thou-

and seven hundred and twenty-four miles.

SOPHRONIUS.

Such are these bodies, which the darkness of ignorance represented to us as no larger than lighted torches! What vast discoveries has knowledge disclosed to the world!

POLYMETIS.

But we have yet considered only a very small part of the heavens. Though the planets or stars we have mentioned are of such vast bulk, and each of them takes such a prodigious circuit in its course, still this appears nothing in comparison of the great whole. These all belong, as it were, only to one division, and receive all their light from the same sun which gives it to us; though the planet Saturn is placed seven hundred and seventy-seven millions of miles distant from the Sun; Jupiter four hundred and twenty-four millions; Mars one hundred and twenty-three millions. Our Earth is nearer it,
being

being eighty-one millions of miles distant; Venus fifty-nine millions; and Mercury thirty-two millions distant.

But far beyond all these, are what are called the fixed stars; so named, because for many years together they seemed not to move. According to the observations of the most eminent astronomers, the Dog-star, supposed to be nearest of all the fixed stars, is distant from us about two millions of millions of English miles. And it is very probable that all the fixed stars are distant from each other in proportion to the distance of the nearest of them from our Sun. So great is the number of them, that they are beyond all computation. For when observed with a good telescope, they appear millions beyond millions, till by their immense distance they evade the sight, though assisted by the best instruments.

SOPHRONIUS.

I believe the constellation called the Seven Stars, as appearing no more to the naked

naked eye, contains no less than seventy or eighty stars, which may be distinguished by a telescope. We admired, and were astonished at the wonders of the earth where we dwell, the vast and profound sea, the wide-spread land, the rolling rivers, and lofty mountains! But what are those but points and atoms, when compared to the inconceivably immense firmament of heaven, and those vast bodies or worlds beyond worlds, with which it is stored!

PARMENIO.

I am lost in admiration at the thought.

POLYMETIS.

There is great reason to think that each of the fixed stars is a sun like ours, which affords light and heat to a certain number of inhabited planets or worlds, in the same manner as the Sun does to the Earth, and the inhabited planets Saturn, Jupiter, Mars, Venus, and Mercury. For it is certain beyond contradiction, that all these,

these, though they appear to us to shine, are in reality dark bodies, like this Earth, and receive all their light and heat from the same Sun which enlightens and warms us; and that it is only from the reflection of that light back again, that they appear luminous bodies to our eyes. But as Jupiter and Saturn are placed at a vast distance from the Sun, they have each of them several satellites or moons moving round them in various circuits, to augment their light. Of these Jupiter has four: the first or nearest of which moves round him in one day eighteen hours and a half; the second, in three days thirteen hours and a half; the third, in seven days three hours and three quarters; the fourth in sixteen days sixteen hours and a half. — Saturn has no less than five moons attendant on him: the first moves round him in one day twenty one hours; the second, in two days seventeen hours; the third, in four days twelve hours and a half; the fourth in fifteen days twenty-two hours; the fifth in seventy nine days seven

Seven hours.—Now, as we know that our Moon moves round the Earth in twenty-seven days and seven hours, and is of particular service to us in affording us light by reflection during the Sun's absence, so it is natural to think, that those satellites or moons moving round Jupiter and Saturn in the same constant revolution, are intended for the same purpose as our Moon; and that therefore there are inhabitants in those planets, which stand in need of a regular supply of light as much as we do.

SOPHRONIUS.

The idea is so extremely probable that it admits of no doubt. But you will please to remember, that Dr. Herschell has discovered some other satellites, besides a new planet, the Georgium Sidus, accompanied with two satellites.

POLYMETIS.

I had indeed omitted to mention them,

PARMENIO,

PARMENIO.

But is it a fact, that dark bodies, when enlightened by the Sun, may appear luminous to the eye?

POLYMETIS.

The fact is plain beyond all question, from the appearance of our Moon: which, of itself, is most certainly a dark body, like this Earth, and has no other light but what it receives from the Sun: it is only the reflection of that light back again, which makes the Moon appear to us as a body of light.

SOPHRONIUS.

Undoubtedly. Unless this was really the case, that the Moon is a dark solid body, there could no such thing happen as an eclipse of the Moon, nor what we call an eclipse of the Sun. For it is well known to astronomers, that an eclipse of the Moon proceeds from no other cause, than that the Earth, in its circuit round the Sun, coming between the Moon and
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the Sun, the light of the Sun is prevented from falling on the Moon, and consequently the latter appears, as it really is, a dark body.

POLYMETIS. Precisely so: and in the same manner, what we call an eclipse of the Sun, is in reality, an eclipse of the Earth: for it is occasioned by the Moon's coming between the Sun and the Earth: and whenever this happens, the Moon, as being a dark solid body, intercepts the rays of the Sun from falling on that part of the Earth which it covers, and consequently darkness overshadows it.

PARMENIO. It was, I think, Copernicus who first made the discovery that the Sun stands still. The fact is now scarcely questioned: but whence comes it then, that in the Sacred Scriptures, the Sun is mentioned as moving round the Earth?

POLYMETIS.

POLYMETIS.

That the Sun actually moves round the earth, was maintained by the ancient astronomers, and had always been the popular opinion: the same mode of speaking therefore was adopted in the Scriptures, lest the belief of men might have been shocked by an assertion so repugnant to common sentiment. It is now certain, that the sun remains always in one place, in the midst of the six planets or worlds formerly mentioned, and which all move round him as their centre, in different circles. First Mercury (which is so near the Sun, that its light and heat is seven times as great as the greatest with us, so that our water there would be for ever boiling hot) performs its circuit round the Sun in eighty-eight days. Its surface is about sixty-two millions of square miles: it has another motion round its own axis, like the Earth; but in what time it performs this, cannot be determined. In the next circle moves Venus, whose surface

surface is above a hundred and ninety-six millions of square miles. It moves round the Sun in two hundred and twenty-four days twelve hours, and turns round itself in twenty-three hours. In the next circle, moves the Earth, attended by the Moon. The Earth performs its circuit round the Sun in three hundred and sixty-five days five hours and forty-nine minutes: its surface contains about a hundred and ninety-nine millions of square miles. The Moon goes the circuit round the Earth in twenty-seven days and seven hours, and turns round her own axis in the same time. Her surface is above one million four hundred thousand square miles; and she is distant from the Earth about two hundred and forty thousand miles. Mars moves round in the next circle, which it goes through in one year three hundred and twenty-two days, and moves round its own axis in twenty-four hours forty minutes. Its surface is above sixty-two millions of square miles. In the next circle moves the planet Jupiter,

piter, which is eleven years three hundred and fifteen days in going round the Sun, but turns upon its own axis in nine hours and fifty-six minutes. Its surface greatly exceeds twenty thousand millions of square miles. Its Satellites, as was before observed, are continually revolving round it. In the last circle moves the planet Saturn, which is twenty-nine years one hundred and sixty-six days in going round the Sun. Its surface is above fourteen thousand millions of square miles.

Now, as we know that all those planets have the very same motions as the Earth, and that the design of the Earth's motions is to produce the changes of day and night, of summer and winter, for the convenience of its inhabitants; is it not reasonable to conclude, as God ordains nothing in vain, that the motions of the other planets are intended for the same end, viz. change of day and night, summer and winter, for the use and benefit of the inhabitants of each planet?

SOPHRONIUS.

Reason strongly authorises such a conclusion. And the Moons of Jupiter and Saturn, which are never perceptible to our naked eye, seem to confirm these sentiments: for it will be readily granted, that the Earth's, or our Moon, is designed to give light to the Earth in the absence of the Sun. Is it not probable therefore, that the Moons of Jupiter and Saturn are designed for a similar purpose. Jupiter and Saturn have each several Moons, and the latter likewise a Ring, all probably intended to supply the light, and perhaps to increase the heat received from the Sun. Now, if Jupiter and Saturn be not inhabited, to what end is all this care, all these wonderful contrivances to supply them with light and heat?

POLYMETIS.

What grand and magnificent ideas does it give us of the great Creator, to suppose that all these planets are full of life, each furnished

furnished with its respective inhabitants, perhaps of different natures and degrees, but all enjoying the pleasure of existence? Is not this a more rational opinion than to suppose them made to twinkle in the firmament, only for us to look at? But still more grand are the ideas which learned men entertain of the creation. For they not only suppose that the planets now mentioned are inhabited, but that each fixed star is a Sun like ours, which heats and enlightens a certain number of planets, or habitable worlds, all revolving round it, as the Earth and the other planets belonging to our system do about the Sun.

SOPHRONIUS.

There are indeed many reasons for believing that all the fixed stars are Suns, which enlighten other worlds. For as our Sun shines by its own native light, so do the Stars also; since it is not possible that the light of the Sun should be sent to them, and again transmitted to us.

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We may therefore conclude that they are Suns. The Sun, at the distance of a fixed star, would appear no larger than a star: for were we removed as far from the sun as we are from the fixed stars, the sun and the stars would seem alike. A fixed star therefore may be as large as the sun. None of our planets could at that distance be seen at all. Therefore each star may have a system of planets, though not seen by us.

PARMENIO.

But may it not be said, that the planets, and all the hosts of heaven were created to manifest the power of the Creator to man?

POLYMETIS.

That is doubtless one effect of this grand fabric; and it calls for the praise and admiration of man, to have so glorious a canopy spread over his dwelling: but surely it would be no less absurd than arrogant to imagine that this was the sole end

end of the creation of such vast bodies, especially as the far greater number of them are not visible to our sight.

SOPHRONIUS.

I remember a beautiful passage to this purpose in the Spectator, where he treats of the immensity of the universe, and the numberless worlds that are spread throughout it. If you will give me leave, I shall take the book down from the shelf, and read the passage.

POLYMETIS.

I have a recollection of the paper you speak of, though I should be glad that you read it.

SOPHRONIUS reads.

“ Were the Sun, which enlightens this part of the creation, with all the host of planetary worlds that move about him, utterly extinguished and annihilated, they would not be missed more than a grain of sand upon the sea shore. The space they possess is so exceedingly little in compa-

rison to the whole, that it would scarce make a blank in the creation. The chasm would be imperceptible to an eye that could take in the whole compass of nature, and pass from one end of the creation to the other; as it is possible there may be such a sense in ourselves hereafter, or in creatures which are at present more exalted than ourselves. We see many stars by the help of glasses, which we do not discover with our naked eyes; and the finer our telescopes are, the more still are our discoveries. Huygen carries the thought so far, that he does not think it impossible there may be stars whose light is not yet travelled down to us, since their first creation. There is no question but the universe has certain bounds set to it; but when we consider that it is the work of *infinite Power*, prompted by *infinite Goodness*, with an infinite space to exert itself in, how can our imagination set any bounds to it?"

POLYMETIS.

That passage is highly applicable to our subject, which it illustrates in a beautiful strain of sentiment, suggested by an ingenious imagination. The author likewise seems to have entertained an opinion which appears to me highly probable: it is, that those glorious orbs are inhabited by numberless orders of more glorious Beings, which are betwixt us and our Creator. For is there not reason to conclude, that there are more ranks of beings betwixt God and us, than there are between us and the meanest insects? I think this idea might be improved into a noble emulation for, the aggrandisement of human nature.

SOPHRONIUS.

O that the whole species were animated with so exalted a sentiment!

DIALOGUE XV.

PARMENIO.
HOW much do the Moderns surpass the Ancients in the knowledge of nature!

POLYMETIS.
 Yes, Parmenio, and ought they not to surpass them proportionably in all the duties and exercises of natural religion, as the result of such knowledge?

PARMENIO.
 You have anticipated what I was going to infer. Yes, the wisdom of God appears so wonderful in the creation, and his goodness so evident, that it is astonishing how man can consider the former without admiration, or the latter without sentiments of the most ardent gratitude and affection.

POLYMETIS.

POLYMETIS.

Nothing so much degrades our nature as ignorance and insensibility; for the usual concomitants of these are indolence and vice. Many indulge themselves in the idea that they can very well pass through life, without any such improvement of their faculties in knowledge, as we formerly had occasion to mention; and that therefore they need not trouble themselves to take any pains about it. But surely to increase in knowledge, and to enlarge the capacity of our mind, so as to range over the universe, and examine the nature of things; to discover the wonders that are every where about us, to discern what is beautiful, fit, and honest, in the conduct of our life, and to soar up even to the throne of God by meditation, must certainly afford a higher pleasure, than to pass our lives in the dull insensibility of brutes, without knowledge, and without understanding. But should we even be content with this ourselves, is it

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to be supposed, that such conduct can please our Creator? Can we think he takes no delight to see his creatures, whom he has endowed with the faculty of reason, improved to the highest degree of perfection of which they are capable? And that he is not displeased when he sees them debase themselves, and dishonour their high original by indolence and inconsideration? But to fill our heads with several particulars of nature, without directing our thoughts and enquiries to the author of it, or to be sensible of all his favors and blessings, without becoming more religious and more grateful, is only a criminal abuse of our faculties, and an aggravation of our folly.

The prospect of nature was laid open to us for more noble purposes, to make us better men, and to inspire us with the most exalted sentiments of love and gratitude towards Him who is the author and giver of all good things. It was doubtless the design of God, in that beauty and order which he has displayed in every
part

part of the creation, to attract our eyes, and invite our attention. The knowledge of the wonderful things of nature is not only pleasing to the imagination, but to the understanding. It heightens the joys of every sense, and raises such a rational admiration in the soul as is little inferior to devotion.

SOPHRONIUS, you enter just as I was going to copy the example you gave us yesterday, of illustrating our subject by quotation. Parmenio and I have been discoursing of the proper use of knowledge, especially that of the works of nature.

SOPHRONIUS.

I well know your sentiments on that subject; they are likewise my own.

POLYMETIS.

I am not ignorant of your moral opinions; and it is a great encouragement to be seconded by those whom we esteem. Here is the author I wanted; the admirable

nable Epictetus. Let us attend to him for a moment. "If man, says he, had any sense of honor and gratitude, all that he sees in nature, all that he experiences in himself, would be to him a continual subject of gratitude, praise, and thanksgiving. The grass of the field, which supplies the animals with milk for his nourishment, the wool of those animals, which furnishes him with cloaths, ought to fill him with admiration. When he sees the clods of earth crushed and broken to pieces by the plough share, and a long ridge thrown up for the reception of the seed, he ought to cry out, how great is God! how good, in having procured for us all the instruments proper for tillage! When he sits down to table to eat, every thing should recall God to his mind, and renew his gratitude. 'Tis He, he should say, who has given me hands to take up my food, teeth to break and grind it, a stomach to digest it; and what is the subject of praises which more nearly concern me, it is He who, to all the benefits
he

he confers upon me, adds the inestimable advantage of knowing the author of them, and making such use of them as is conformable to his will. As then, continues the same Epictetus, all mankind are plunged into a deep lethargy concerning Providence, is it not just that some one, in the name of all the rest, should publicly sing hymns and songs to his name? What else can such a weak and lame old man, as I am, do, than celebrate the divine praises? Were I a swan or a nightingale, I would sing, because that would be the end for which I was created. But as reason has fallen to my lot, I ought to employ myself in praising God. 'Tis my proper function and business, which I will regularly discharge, and never cease to discharge, to my latest breath; and I would advise you to do so likewise.' So far Epictetus: Could the most devout Christian say more?

SOPHRONTIUS.

It fills me with admiration. Xenophon has preserved some beautiful observations
made

made by Socrates, to the same purpose, in a conversation with Euthydemus.

POLYMETIS.

I remember it, and we shall read it likewise. Here is the repository of my classics, and the bust of Socrates makes one of its ornaments. I have found the book. The passage runs thus:—

“Have you never reflected, Euthydemus, on the great goodness of the gods, in giving to men whatever they want? He answered, Indeed I never have. You see, replied Socrates, how very necessary light is for us, and how the gods give it us. You say true, answered Euthydemus. And without light, said Socrates, we should be like the blind; but because we have need of repose, they have given us the night to rest in. You are in the right, said Euthydemus, and we ought to render them many praises for it. Moreover, continued Socrates, as the sun is a luminous body, and by the brightness of its beams, discovers to us all
visible

visible things, and shows us the hours of the day; and as, on the contrary, the night is dusky and obscure, they have made the stars appear, which, during the absence of the day, mark the hours to us. They have likewise made the moon to shine, which not only shews us the hours of the night, but teaches us to know the time of the month. All this is true, said Euthydemus. Have you taken notice likewise, that having need of nourishment, they supply us with it by means of the earth! How excellently are the seasons ordered for the fruits of the earth; of which we have such an abundance, and so great a variety, that we find not only wherewith to repel indigence, but to satisfy even luxury itself? This goodness of the gods, cried Euthydemus, is an evidence of the great love they bear to man. What say you, continued Socrates, to their having given us water, which is so necessary for all things? For it is that which assists the earth to produce the fruits, and that contributes, with the in-

fluences from above, to bring them to maturity. It helps to nourish us, and by being mingled with what we eat, makes it the more easily got ready, more useful, and more agreeable. In short, being of so universal use, is it not an admirable Providence that has made it so common? What say you to their having given us fire, which defends us from cold, which lights us when it is dark, which is necessary to us in all trades, and which we cannot be without in the most excellent and useful inventions of men? Without exaggeration, said Euthydemus, this goodness is immense. What say you besides, pursued Socrates, to see that after the winter, the sun comes back to us, and that proportionably as he brings the new fruits to maturity, he withers and dries those the season of which is going over? That after having done us this service, he retires, that his heat may not incommode us, and then when he is gone back to a certain point (which he cannot exceed, without putting us in danger of dying with cold) he

he returns again, to resume his place in that part of the heavens, where his presence is most advantageous to us: and because we should not be able to support either, if we passed in an instant from one extreme to the other, do you not admire that this planet approaches us, and withdraws himself from us by so just and slow degrees, that we arrive at the two extremes almost without perceiving the change? All these things, said Euthydemus, make me doubt whether the gods have any thing to do but to serve mankind: one thing puts me to a stand, which is, that the irrational animals participate of all these advantages with us. How! said Socrates, and do you then doubt whether the animals themselves are in the world for any other end than for the service of man? What other animals do, like us, make use of horses, of oxen, of dogs, of goats, and of all the rest? Nay, I am of opinion that man receives not so much advantage and convenience from the earth, as from the animals: for the

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greater

greater part of mankind live not on the fruits of the earth, but nourish themselves with milk, cheefe, and the flesh of beasts; they get the mastery over them, they make them tame, and use them to their advantage, in war, and for the other necessities of life. I own it, said Euthydemus: for some of them are much stronger than man, and yet are so obedient to him, that he does with them whatever he pleases. Admire yet farther the goodness of the gods, said Socrates, and consider that as there is in the world an infinite number of excellent things, but of very different natures, they have given senses that answer to each, and by means of which we enjoy all of them. They have endowed us with understanding, which makes us enquire into, and retain the things which the senses discover to us, and teaches us for what they are proper; which enables us to find so many admirable inventions, to put us at our ease, and to protect us from inconveniences. They have likewise given us speech, which serves

serves us to communicate reciprocally all sorts of good things, and by which we publish laws, and govern our states and kingdoms."

POLYMETIS.

How just is this method of reasoning! how full of discernment! and yet how simple!

SOPHRONIUS.

Yes, in this instructive manner did Socrates use to discourse with his friends, thereby raising their minds from a thoughtless inattention, to contemplate and reflect on the glorious works of the creation, so admirably contrived for the service and delight of man; and thence stirring up in their breasts a spirit of piety and gratitude towards the great and beneficent Creator of the universe.

POLYMETIS.

I rejoice that we are enabled to confirm our own sentiments, by two examples which redound so much to the honor of

Greek philosophy, and we might likewise adduce the authority of Cicero to the same purpose; but that we may have the additional support of one modern writer, I shall read the paragraph with which the pious Archbishop of Cambray concludes his Survey of the Works of the Creation.

“ O my God! if the greater number of mankind do not discover Thee in that glorious shew of nature, which thou hast placed before our eyes, it is not because thou art far from every one of us. Thou art present to us more than any object which we touch with our hands; but our senses, and the passions which they produce in us, turn our attention from thee. Thy light shines in the midst of darkness, but the darkness comprehends it not. Thou, O Lord, dost every where display thyself; thou shinest in all thy works, but art not regarded by heedless and unthinking man. The whole creation speaks aloud of thee, and echoes with the repetitions of thy holy name, but such is our insensibility,

sensibility, that we are deaf to the great and universal voice of nature."

PARMENIO.

I know nothing on the subject more beautiful than the hymn at the conclusion of THE SEASONS.

POLYMETIS.

It is admirable. 'Tis a favorite production both with Sophronius and me; and, Parmenio, you shall read it to us all after supper.

DIALOGUE XVI.

PARMENIO.

WHEN I cast my eyes around a Library, such as yours, Polymetis, I think I see a number of Sages, pointing out to me the fields of knowledge, and directing me how to trace the paths which lead to virtue and happiness.

POLYMETIS.

The idea may seem a little fantastical, Parmenio, though so far from being an object of ridicule, it merits approbation. But is there none amongst all those Sages, that appears to have mistaken the road which leads to the goal of happiness?

PARMENIO.

I suspect indeed that there are several :
but I carry with me a clue, by means of
which

which I am enabled to extricate myself, when I think they have led me into error.

POLYMETIS.

An excellent contrivance! But where have you found this invaluable clue, which may not improperly be named, the Knowledge of Good and Evil?

PARMENIO.

It was given me when a child, by a person of great piety and virtue, on whose judgment and sincerity I might implicitly rely; who assured me, that I should ever find it a faithful guide, amidst every perplexity and temptation that I might meet with, in my progress through life.

POLYMETIS.

A more admirable talisman never was bestowed upon mortal. But amidst the cloud of metaphor in which you envelop yourself this morning, methinks I can penetrate the veil. The clue which you have so ingeniously fabricated, is no other than the Precepts of Scripture.

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PARMENIO.

PARMENIO.

Were I now the Sphinx of antiquity, my doom would be determined: for you have explained my enigma.

POLYMETIS.

I triumph far less in my own discernment, than I rejoice at your prudence. You have chosen an infallible guide through all the intricacies of human speculation on the subjects of philosophy; and to attain to happiness, have only to persevere in resolution. The *To Kalon* of the Greeks, and the *Summum Bonum* of the Latins, which comprised respectively the objects of philosophical research, appeared not the same in the eyes of every inquirer; and therefore implicitly to adopt any of their systems, would, if not productive of some fatal error, prove at least the cause of a suspension of judgment, which, in a matter of great importance to our interests, can never be unaccompanied with anxiety. There can be no better rule to determine the merits of any system of philosophy,

philosophy, than by collating its moral principles with those of revealed religion.

PARMENIO.

That indeed is now likewise my own opinion.

POLYMETIS.

When I read the doctrines of Epicurus, which recommend an indolent and improvident regard to present tranquillity; or those of the Stoics, who maintained a fatal necessity in human events, as well as an unnatural apathy; I neither can, on one hand, find any security for temporal happiness, nor on the other, be able to conceive, what certainly is inviolable, the justice of Providence in the rewards and punishments of a future state. If, desirous of farther instruction, I have recourse to the three celebrated academies of ancient times, I am bewildered amidst the effusions of ingenious discussion; one deciding what is truth; another determining in the negation of the same

same subject; and a third, which dissents from both, equipoising the dictates of the human understanding in the scales of uncomfortable doubt. Should I seek for refuge amongst the Cynic philosophers, I am not more offended with their principles, than shocked with the indelicacy of their practice. Should I have recourse to the peaceful Bramins of India, I find the simplicity of their life debased by the singularity of their tenets. The Koran bespeaks the extravagance of an enthusiastic impostor; the Shaftah of the Gentooes, the most whimsical credulity. In a word, after making the circuit of human superstition, I can find no resting place for the mind but in the regions of Theology.

PARMENIO.

You describe the cause of your perplexity in a manner equally animated and just; but have you found nothing to excite hesitation or mistrust, in the happy retreat you have chosen.

POLYMETIS.

I have indeed found, to my great regret, a variety of opinions even there; but I endeavour to ascertain the truth, to the best of my understanding.

PARMENIO.

With a mind so rationally inquisitive as yours, had it been your lot to have been born within the precincts of Mahometan superstition, or even that of the Lama of Tartary, you must, by your own industry and invincible thirst of knowledge, have become a self-converted proselyte to the Christian religion.

POLYMETIS.

I own that I have always had a strong propensity to the acquisition of useful knowledge, at the head of which department, above all competition for precedency, stands that of religion. On that alone can be founded tranquillity of mind in this world, and the assurance of hap-

happiness in the next. But along with this essential knowledge, I should likewise wish to cultivate those parts of science, which have even no other claim to regard than as being ornamental; though what rationally amuses the mind, must ever be justly entitled to a higher degree of privilege than mere toleration.

PARMENIO.

Undoubtedly: and we should greatly reduce the sphere of intellectual enjoyment, did we confine the excursions of genius to what is strictly useful.

POLYMETIS.

Yes, literature affords elegant recreation, as well as valuable knowledge; and these ought to have their due alternations, in a well regulated economy of our time. Imagination, no more than reason, was not given us never to be exerted; only let us employ it in the embellishment of virtue, not the decoration of vice. Upon

this principle, can any thing afford more elegant entertainment than excellent productions of poetry, especially those of the epic kind? Did you ever read the Iliad or Odyssey of Homer, without a high relish of their beauties? But their merits consist not alone in the force of description, or the variety of poetical images which they present to the fancy: for amidst those strong recommendations to our taste, they abound with moral instruction, conveyed indeed indirectly, but on that very account more insinuating.

PARMENIO.

You are then of the same opinion with Horace. I remember that in one of his Epistles, speaking of the Grecian bard, he hesitates not to give him the preference, in point of moral edification, to two great philosophers of that country, Chrysippus and Crantor.

POLYMETIS.

POLYMETIS.

Yes, in one of his Epistles to Lollius, he does give the preference to Homer.

*Qui, quid sit pulchrum, quid turpe, quid utile, quid non,
Plinius ac melius Chrysippo & Crantore dicit.*

And however great may have been the merits of those philosophers, the opinion of Horace, considering the principle on which it is founded, is undoubtedly just. He means that Homer, by judiciously exemplifying different characters in the conduct of life, has done more to promote the cause of wisdom and virtue, than either the moral discussions or precepts of the most eminent philosophers. For though these may be approved by the understanding, it is the former only that seize the affections, and make a lasting impression upon the mind; to which effect the decorations of poetry not a little contribute.

PARMENIO.

I perfectly conceive the distinction: and it is beyond a doubt, that striking ex-
amples

amples operate far more powerfully than precepts. But is it not surprising, that amidst the multitude of those who have cultivated a taste for the Muses, so few have attempted, and still fewer succeeded in their efforts, to obtain immortal renown in this species of poetry?

POLYMETIS.

The laurel crown is indeed such a prize, as might stimulate to the greatest exertions; but besides the vast strength of genius required for an epic poem, history supplies few incidents suitable to form the subject of that production; and religion has abolished the mythology from which it derived so essential a part of its support.

PARMENIO.

As you are so conversant with the various productions of the Ancients, permit me to ask you, whether you give the preference to Greek or Roman literature?

POLYMETIS.

POLYMETIS.

Your question, Parmenio, comprises so many considerations, that it scarcely admits of a satisfactory answer in general terms; and to descend to particulars, would lead us into a wider field of investigation than, at present, we have leisure to enter upon. But tell me what province of literature you wish to make chiefly the subject of comparison.

PARMENIO.

Poetry being the department which I think displays genius the most, and is likewise the fittest for rivalry, I should wish to be favoured with your sentiments on that interesting subject.

POLYMETIS.

If we consider poetry in its various kinds collectively, there is no subject on which the Greeks are more entitled to praise and admiration. They appear to have been for several ages the peculiar favorites of the Muses.

PARMENIO.

PARMENIO.

And what, do you imagine, could have led them to such eminence in poetry?

POLYMETIS.

It is probable that the freedom of their governments first laid the foundation of their fame. It opened their minds to the flow of sentiment, and gave boldness and vigor to the exercise of the imagination. But I think there must have been something in the climate of Greece, which influenced in a particular manner their disposition to poetry: and even the natural melody of their language may have contributed to promote, as much as it adorned those kinds of composition which derive a great part of their excellence from richness and variety of modulation.

PARMENIO.

It is indeed a general opinion, that climate has a powerful influence on the genius and dispositions of people: but if this be really the case, whence comes it

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that

that the present inhabitants of Greece discover no taste for those compositions which were the glory and delight of their ancestors? Not a single Grecian, so far as we know, has ascended Parnassus for many ages; and the vocal hills of Arcadia no more resound to the Doric reed, or the amorous song of the shepherd.

POLYMETIS.

Though no change can have taken place in the climate of the country, there has happened a great alteration in the two other circumstances which I mentioned: the government, instead of being free, is now become a military despotism; and the language of the ancient Greeks, which charmed the ear with the softness of its modulation, now offends it with the harsh intermixture of the guttural and unpolished language of Tartary. The race of the people is doubly debased by slavery and the phlegmatic temperament of their conquerors. Polygamy supports a constant languor, which is farther increased by the

the habitual luxuries of coffee, tobacco, and opium. From all these causes, the mind being enervated with the body, emulation, the thirst of fame, and every sprightly idea are extinguished. I might add, that the state of barbarism into which that nation is now sunk, completes the discouragement of literature amongst the Greeks, or rather the total ignorance of it.

PARMENIO.

The circumstances you mention must be powerful causes of degeneracy; and perhaps the prohibition of wine may not be without its effect, on the prosecution of those pursuits which require a liveliness of fancy.

POLYMETIS.

The conjecture is highly probable. Had such a prohibition been strictly enforced in the days of Anacreon, I question whether the springs of Castalia would have proved alone sufficient to inspire some of his productions.

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PARMENIO.

PARMENIO.

Did not the prophet of the Mussulmen encroach upon the principles of natural religion, when he prohibited even the moderate use of a blessing bestowed by Providence upon the country, and which, by its enlivening quality, tended to excite sentiments of gratitude towards the beneficent Creator?

POLYMETIS.

His conduct in this respect was of a piece with the tenor of his motley institutions in general. His hypocritical policy trampled upon the barriers both of natural and revealed religion, as suited the secret objects which he always had in view. It was less his intention to restrain voluptuousness among the people, than to direct the pursuit of it into such a channel as might co-operate towards the establishment of his ambitious purposes.

PARMENIO.

PARMENIO.

I find that I have unintentionally deviated, in some measure, into the practice of that impostor: for while I expressed a desire of knowing your sentiments respecting literature, I have drawn the conversation from the seats of polite learning in Greece, to the barbarous regions of Arabia. But to return from the digression: I believe you will readily admit, that the only Roman who can dispute with Homer the palm of epic poetry, is Virgil. They have each of them represented Jupiter as weighing in the scales of fate the fortunes of their principal heroes: will you, assuming the balance of the God, put themselves into the scales of criticism, and determine with strict poetical justice which of the two is superior?

POLYMETIS.

You appeal to me, Parmenio, for the decision of a point which has baffled the

penetration, or damped the inquiry of a number of intelligent critics; and to attempt a final solution of the problem, might favour more of presumption than judgment. There will however be no danger of violating equity, if we allow to Homer the merit of extraordinary invention, and to Virgil, of successful imitation. If the Greek bard sometimes soars higher than the Roman, perhaps the latter compensates by a more stationary elevation in the tracts of sublimity. Should we take into consideration the characters of their heroes, our affections are more interested in the progress of the pious Æneas, than of the stern and inexorable Achilles. As poems consecrated to national glory, the Iliad, by the rivalry of Greek and Trojan characters, seems to reflect less lustre upon the states of Greece than the Æneid upon the empire of Augustus.

PARMENIO.

I know not whether my idea on the subject be just, but I think the grandeur
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of Homer is more awful, and that of Virgil more majestic.

POLYMETIS.

In my opinion the discrimination is well founded. I would only add, with regard to the comparison, as a circumstance advantageous to the *Æneid*, that it happily unites in its fable both the narrative and descriptive beauties of composition, which are separated in the poems of Homer.

PARMENIO.

Did the productions of the Grecian lyric poets remain equally entire with those of Homer, they would furnish another glorious monument of the genius of their country.

POLYMETIS.

Beyond all doubt : the poetry which, in spite of its extinction, has rendered immortal the names of its authors, must itself have merited immortality. The few lyric productions that have survived

the ravages of time and barbarians, excite our admiration; and of the excellence of those which are now lost, we may rest assured upon the commendations of Horace. For fascinating softness the Odes of Sappho, and for vigor and animation, those of Alcæus, were probably never surpassed by any poetical compositions. The boldness, the rapidity, and the sublimity of Pindar, have bid defiance to all imitation. The Latin elegiac productions are some of the most pleasing in that language, but I am persuaded they are greatly inferior to those of the Greeks.

PARMENIO.

I perceive that your opinion tends in general to establish the superiority of Grecian genius.

POLYMETIS.

We must necessarily allow the Greeks the merit of originality; and that being granted, it would be difficult to disprove their title to superiority of fame. The
Augustan

Augustan Age however exhibits a glorious contention of rivalry in a different language. But there seems to be a more evident distinction of Greek and Roman genius in dramatic poetry than in any other species of composition. The Comedies of Terence, with all their elegance and purity, are greatly inferior in point of the *vis comica*, to the numerous productions of Menander. In the opinion of Julius Cæsar, no incompetent judge of literature, their excellence reached only to the middle of the Grecian standard: "*O dimidiate Menander.*" And if this was the case in comedy, the difference is still more conspicuous in the other department of the drama; where we meet with nothing that can rival the beautiful tragedies of Sophocles and Euripides, either in character, sentiment, or pathos; though according to Quintilian a few excellent compositions of this kind were produced by Roman poets.

DIALOGUE XVII.

PARMENIO.

HAVING been favored with your sentiments relative to the poetry of the ancients, I now wish to have your opinion on another department of genius. It has been said, *Fimus oratores, nascimur poetæ*; we may become orators by application, but we must be born poets. What think you of the most distinguished orators of the Greeks and Romans, Demosthenes and Cicero? Do you judge of them as standing upon the same level with the poets of their respective nations?

POLYMETIS.

I think we may admit that a genius for oratory is not necessary in so great a degree as for poetry; and without doubt,

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the former may be improved by application more than the latter: as was indeed the case with Demosthenes, who, to correct a vicious habit of pronunciation, is said to have practised a method of speaking with pebbles in his mouth. With regard to those two orators, however, there are a few circumstances which seem to diversify their characters as objects of comparison. In fluency, propriety, and warmth of expression, they are equally conspicuous, and with action perhaps they likewise equally affected their audience: but the eloquence of Demosthenes is more rapid, vehement, impassioned; that of Cicero more diffuse, splendid, and attracting. The Greek appears impetuous with ardor, the Roman impressive with address. The eloquence of the former may have been better accommodated to the fickle and turbulent dispositions of a democratical republic; that of the latter, to a mixed constitution, more respectable by the dignity of the senate. I believe, that changing their situations, Cicero

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would

would have spoken with more effect in an assembly at Athens, than Demosthenes in the Capitol at Rome, or even in the Forum: for I suspect that the fame of the Greek was greatly favored by the superior sensibility of his countrymen.

PARMENIO.

That was doubtless a circumstance highly favorable to the successful exertion of genius, and it seems to have had an auspicious influence on the cultivation even of those literary pursuits which agitate the affections far less than poetry or eloquence; I mean history. The composition of Herodotus, when recited by himself at the Olympic Games, was honored with public commendation, to which perhaps the world was afterwards indebted for those of Xenophon and Thucydides. Do you think that the Romans have equalled the Greeks in historical narrative.

POLYMETIS.

I think, in the field of history, they have even surpassed them. With elegance

gance and purity of style, they have interwoven philosophical reflection; and besides a lively description of characters, they frequently embellish their narratives with compositions of eloquence. I allude chiefly to Livy and Sallust.

PARMENIO.

In the department of philosophy, I imagine you will allow the Greeks to have excelled? for——

POLYMETIS.

Good morning, Sophronius! While we have been talking of Greek and Roman writers, you possibly have been enjoying the luxury of some of their best compositions.

SOPHRONIUS.

I have indeed been employed upon the two volumes which I carried last night into my apartment.

POLYMETIS.

They were, I think, Plato and Cicero?

SOPHRONIUS.

SOPHRONIUS.

They were.

POLYMETIS.

Then we could not have been favoured with your company at a more seasonable time: for you come at the very moment when Parmenio had asked my opinion of Greek and Roman philosophy. Give me leave to refer the question for your answer.

SOPHRONIUS.

Where taste and learning are concerned, I shall ever entertain the most respectful deference for the sentiments of Polymetis: I therefore beg leave to decline the polite requisition.

POLYMETIS.

You almost make me imagine that I hear Plato at the Court of Dionysius: but you will oblige me more by acquiescence than evasive compliment.

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In the mean time, let me observe, what may appear not a little extraordinary, that in surveying the literature of the ancients, when we pass from the productions of the imagination to those of the understanding, we discover a remarkable difference in the capacity of those two faculties of the mind. After being delighted with the richness and grandeur of the former, we are surprised at the uncertainty, the extravagance, and sometimes even the imbecility of the latter. To what principle in human nature can we ascribe this unfortunate defect? Is the light of Reason not clear of itself, or is it obscured and misguided by the prejudices, the passions, and the caprices of men?

SOPHRONIUS.

It seems indeed to be often influenced by the causes you mention. We cannot otherwise account for the extreme diversity of opinion amongst the various sects of philosophers.

POLYMETIS.

POLYMETIS.

That circumstance has often excited my astonishment. The road which leads to virtue and happiness, though narrow and beset with temptations, seems however to be not only direct but void of perplexity: yet how much has it been mistaken or misrepresented by moralists! The professed object of them all is, to ascertain truth with precision: yet in the prosecution of this purpose, how inconsistent, and even ridiculous, is their conduct! While they tell us that Truth is hidden at the bottom of a well, they nevertheless affect to search for her in every region of nature, the air itself not excepted. At last, when they conclude that they have discovered her, they will yet sooner question the evidence of their senses than admit her reality; and through a series of arguments, avowedly conducted by reason, will labor to annihilate the sacred authority of reason itself. Can even madness produce more flagrant inconsistencies

consistencies than we find in the discordant sentiments of those who have devoted themselves to the cultivation of wisdom?

SOPHRONIUS.

I am convinced, that a great part of what is dignified with the name of philosophy is not the genuine offspring of the understanding, but a supposititious production, engendered in the recesses of the heart, and, like most of the phantoms which issue from that source, derives its origin in vanity.

POLYMETIS.

We both coincide in opinion. Were it possible to penetrate into the hearts of those who have been industrious to signalize themselves as founders of sects in philosophy, I am persuaded we should discover that the motive you mention was, at least with many of them, the predominant principle which gave rise to their systems. Philosophers, as well as poets and orators, have been sensible to

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the allurements of fame; and where this could not be obtained by pursuing the tracks of their predecessors, they felt little scruple of deviating into bold and plausible innovation. The new and the middle academies seem both to have been influenced by this cause. For, with respect to the old academy, established by Plato, it was founded upon the ruins of no preceding sect.

Were we to trace philosophy through the history of its various professors, we should find, that it has frequently had its empirics, as well as medicine. There has likewise been, at different periods, a temporary fashion in each of these provinces, according to the influence of the person who happened to have the ascendancy in the realms of science. Did not philosophy fluctuate in Athens from principle to principle, amidst the fortuitous succession of academic teachers, who were emulous of distinction? And was not all Rome repeatedly put into motion by some adventurous declaimer, whom ambition or avarice,

rice, and the incidental tide of novelty, had imported amongst them from Greece?

Of the various revolutions which have happened in the profession of physic, I shall give you a short account.

In the sixteenth century, when the reputation of amulets, enchantments, and the like, began to decline among the people, a new theory was introduced, which might lay the foundation of such practice in physic, as would be apparently more solid, and amuse mankind with a shew of learning and philosophy. This doctrine was that of Fermentation, begun in the head of Sylvius, a professor of medicine at Paris.

In order to propagate his system the more effectually, he supported it with such specious arguments as his ingenuity could invent. And physiological reasoning being then but little known in the profession, his strongest proofs were drawn from analogy only. He insisted that all diseases proceeded from a fermentation, which was the means made use of by na-

ture to throw off whatever is injurious to the constitution. That it was with the humors of the human body as with those of a political government, which, on any extraordinary emergency, are thrown into violent agitations. That the truth of this opinion needed no other confirmation than that, by such a process chiefly, every liquor is purified.

These sentiments were so conformable to the manner of thinking which prevailed at that time, and so seasonable for the exigencies of the faculty, which was evidently falling into contempt, that they were immediately adopted. The youth from every quarter now flocked to Paris, to be instructed how to excite and regulate an intestine motion in the fluids of their patients. In this way they fermented for near a hundred years, when Bellini, an Italian physician, endeavored to introduce into physic the use of mathematical knowledge.

He taught, that as the human body was a machine, consisting of solids and fluids,

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its economy and diseases ought both to be investigated by the principles of mechanics. But a theory which depended so much upon experiment, and which must have subjected its professors to the rigid laws of science, could not be tolerated by an order of men, who had always been accustomed to the utmost licentiousness of opinion. They determined therefore to oppose this innovation; and for that purpose a spirit was called up to their assistance. Their notions were now so much refined and subtilized, that not content with accounting for diseases by the action of air upon the fluids, it was maintained that they were produced by an intelligent agent within us, who presided over the economy of the body, and directed its operations. The author of this opinion was Dr. Stahl. He had no doubt taken the hint from Van Helmont, who, about a century before, asserted the existence of an Archeus, or little invisible being, which conducted the digestion of our food, and had its residence in the stomach.

The extravagant jargon of the faculty now surpassed all human comprehension. And it is probable that the theory they now maintained would have utterly ruined the profession, had not Hoffman invented a new doctrine, or rather only an improvement on the old. He insisted that acute diseases were not produced by an Archeus, or spirit, but that they were owing to a sensibility of the solid parts of the body, which, upon feeling any thing hurtful to the constitution, presently contracted all its fibres, to expel the enemy. It was no hindrance to the success of this opinion, that they were not conscious of any such spasm as the author endeavoured to establish. They embraced therefore this new doctrine, and their notions were again contracted within the limits of matter.

Thus was their fluctuating humor restrained for some time; till Boerhaave, seized with the ambition of being esteemed wiser than all who had gone before him, became the author of a fresh innovation.

vation. As the soul and fibrous parts of the body had both been occupied by former theorists, he resolved to build his system upon the fluids; and to a thick-ness in these, he attributed the cause of all diseases. At once the spasms univer-sally relaxed, and all Europe laboured under disorders peculiar to the constitu-tion of the Dutch.

For many years the system of Boer-haave was held in great reputation; but it has been displaced in its turn; and acute diseases are again ascribed not only to an invisible, but, amidst the subtleties of chimerical opinion, an inexplicable cause.

PARMENIO.

What a series of ridiculous and extra-vagant notions!

POLYMETIS.

It must be confessed, that some of them are the most absurd, and all the most contradictory; that could possibly be
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invented by the human mind. And yet upon these opinions, and the different practices resulting from them, the health and lives of mankind depended, and have been determined. The philosophy of Aristotle was never more perverted in the schools than the simple laws of nature have been by those men, who have probably done more mischief in the world, than all the non-naturals put together.

Amongst the historical authorities to
 you admit those of
 DIALOGUE

DIALOGUE XVIII.

POLYMETIS.

WITH regard to the antiquity of the world, there are indeed different opinions: but I am glad to find that you do not join with those who believe, or affect to believe, that it has existed from eternity.

As there is no other record of the earliest ages but the account delivered by Moses, it is only from his writings, with the additional evidence of ancient historians, in subsequent stages of chronology, that the point can be determined. But by combining those different authorities, we are enabled to solve the problem, if not with perfect accuracy, at least with such a degree of exactness as comes near to the truth.

PARMENIO.

Amongst the historical authorities to which you allude, do you admit those of
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the ancient Egyptians, and the Chinese; the former of whom, if I am not mistaken, were of opinion that the world had subsisted upwards of thirty thousand years; and the latter, we have been told, ascribe to it a greater, and even an indefinite duration.

POLYMETIS.

I should pay no regard to opinions or conjectures unsupported by any evidence, and which contradict the testimony of writers who are entitled to credit.

SOPHRONIUS.

It seems to me, that on such a subject the opinion of the ancient Egyptians is more to be questioned than that of any other nation.

PARMENIO.

Were not the arts and sciences cultivated amongst them at an early period? I should therefore think, that in a matter of speculative inquiry, their opinions were respectable.

SOPHRONIUS.

SOPHRONIUS.

Some of the arts and sciences were doubtless cultivated in Egypt; but in point of historical knowledge, respecting even their own country, they appear to have been greatly deficient. Of this, their fabulous account, relative to Sesostris, Isis, Osiris, and other personages, affords sufficient confirmation.

POLYMETIS.

In whatever degree some of the arts and sciences may have been cultivated in Egypt, there cannot, in my opinion, be a stronger proof of the general ignorance of the people, than the Deification of their Princes, and still more of the numerous animals, which they worshipped with a superstition the most degrading to human nature. But there is another circumstance from which we may likewise infer an uncommon degree of ignorance with respect to historical transactions; and it is this, that all their knowledge was transmitted in hieroglyphical characters,

acters, the signification of which was known only to the priests, and to many even of these, but imperfectly. This class of men, therefore, might, under the imputed sanction of mysterious learning, impose upon the people whatever falsehoods they pleased. The most popular oral traditions are exposed to great corruption, when transmitted through a series of many ages; and we cannot admit those to have been less corrupted, which being secluded from public inspection, behind the veils of the temples, might be invented, altered, or obliterated, according as it suited the inclination, the policy, or even the caprices of the priesthood. For these reasons, I own I should give very little credit to hieroglyphical authority.

SOPHRONIUS.

I am entirely of your opinion; and I think it is fully justified by the nature of hieroglyphical composition. From all that we learn respecting that subject, the hieroglyphical characters were representatives

tatives only of the principal parts of speech, such as nouns, verbs, and adjectives, without any signs to express adverbs, prepositions, or conjunctions: on which account any narrative so conveyed must have been extremely deficient in point of precision. With respect to the interpretation of the object or end of various sentences, a thousand errors might be committed, for the want of such particles as were necessary to denote the numberless relations in which one word may stand to another, in grammatical arrangement. In support of this observation, let me mention one hieroglyphical sentence. It consists of the figures of an infant, an old man, a hawk, a hyppopotamos, and a crocodile; the meaning of which is said to be, "O ye of little faith, God hates impudence."

PARMENIO.

Such a mode of preserving records must have been extremely vague and uncertain. Perhaps you will consider the Chinese language as liable to the same imprecision!

POLYMETIS.

We are told that the alphabet of the Chinese consists of a prodigious number of characters; and from that circumstance alone, there is reason to question, if not its imprecision, at least the possibility of its being universally understood, in a degree sufficient to render it the means of accurate and infallible communication. Besides, from the sequestered situation of the Chinese, and their aversion to any but commercial intercourse with other nations, it is scarcely to be supposed, that they can have made any extraordinary progress in science. True knowledge is of a communicative nature, and rather courts than avoids investigation. The polity of those amongst whom it flourishes is likewise liberal, and remote from the mean jealousies of an ignorant people. But viewing the conduct of the Chinese in these respects, our opinion of them must be unfavorable. That they are extremely obedient to their own form of government,

vernment, is generally admitted; but whether this arises from any peculiar excellence in itself, or from the mysterious veneration in which they hold both the person and authority of their prince, it may be difficult to determine with certainty: though judging from their apparent character, we might ascribe it to their habits of industry, and their quiet dispositions, rather than to any enlightened attachment to their constitution, upon enlarged and determinate principles of political enquiry. That amongst a people living perpetually undisturbed by foreign wars or civil commotions, the uninteresting annals of past ages should be carefully preserved, in any form, either of written records or oral tradition, seems repugnant to probability.

SOPHRONIUS.

The polity of the Chinese, perhaps, may be regulated by salutary laws and customs, well adapted to the preservation of public tranquillity, and they may boast
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of a Confucius, who is said to have irradiated their empire with the light of moral science, but we cannot reasonably entertain any high opinion of their literary acquisitions. Totally unacquainted with the writers of other nations, their researches into antiquity can ascend no higher than the fabulous history of their own; and perhaps their legitimate chronology is restricted to the memorable, but not remote epoch, which fixed the boundaries of their empire. Their opinion, therefore, respecting the age of the world, is entitled to very little attention.

PARMENIO.

I am fully convinced, from the observations which each of you has made, that neither the opinion of the Egyptians nor the Chinese can justly be regarded as of any validity in determining the question. But a whimsical idea now strikes me: give me leave to indulge it one moment. I would not be understood as if I thought, with some ancient philosophers, that the world is a huge animal; but admitting it
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to be totally inert, may it not, however, like animal bodies, discover upon its surface, or within its bowels, some traces of longevity, by which its age might be determined?

POLYMETIS.

Your question, Parmenio, is at least ingenious; and perhaps Sophronius may be of opinion with me, that it is not so whimsical as may at first sight appear. But let us distinguish between the age of the world and its old age. That it betrays no symptoms of effeteness, I think, is evident; unless indeed in stones and rocks, from their long exposure to the air. If we except the garden of Eden, the world, I doubt not, has at the present moment all the vigor and luxuriance which it possessed when it came from the hand of the Creator. Though in particular parts, its richness may be exhausted by repeated production, it yet contains within itself those vivifying principles, which, nourished by manure, and actuated

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by the heat of the Sun, renews all its former fertility. In winter it is liable to a chillness and torpor, not unlike the period of old age in the animal kingdom; but no sooner does the Spring return, than it resumes the bloom of youth, and proceeds to pour forth its various and exuberant stores in a plentiful harvest.

Such is the state and appearance of the surface or face of the Earth: but those who have examined its bowels, in some parts of the globe, particularly in the neighbourhood of Mount Vesuvius, make some observations which would seem to justify an opinion that the world is of much greater antiquity than is generally imagined. There is in such conjectures a degree of plausibility, but the arguments by which they are supported seem not to be decisive upon physical principles; because fortuitous circumstances may concur at one time to accelerate a process in nature, which at another may be retarded from accidents of different efficacy.

SOPHRONIUS.

SOPHRONIUS.

A few suggestions to the same purpose have lately been made by some inquirers in the province of chemistry; but I think we ought to be cautious in admitting theoretic conclusions, in opposition to probability, particularly against the evidence of Sacred History.

POLYMETIS.

Without doubt, Sophronius; and it is consistent with your usual judgment, that you have introduced probability into the argument. I think probability strongly favors the Mosaic account of the first ages of the world: for, were any credit due to the opinion of the ancient Egyptians, or Chinese, can we suppose that the arts and sciences would not have begun to flourish at a much earlier period? That geography in particular would have remained so long unimproved? That civilization would have been so late in extending to the regions which at length it has reached? And can we suppose that History

would not have commenced its narrative from an epoch far more remote than the origin of the Assyrian empire?

SOPHRONIUS.

Not to mention the uncertainty whether the calculation of the Egyptians relates to lunar or solar years, all these considerations are forcible arguments in favor of the generally received opinion of the antiquity of the world.

PARMENIO.

I acknowledge it: but what are the objects which mark the different spaces of duration in extreme remote times?

POLYMETIS.

Those objects are, in the first place, the creation of the world, of which the only account is that delivered by Moses; and in the next, the deluge, transmitted by the same writer: to whom we are also indebted for the continuation of chronology, until the profane historians commence their detail; from which epoch,

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the progress of time may be calculated through its subsequent periods.

PARMENIO.

With respect to the preceding history of the world, there seems then to be sufficient ground for our resting assured; but of its future duration, I believe neither reason nor revealed religion can authorize the smallest conjecture.

POLYMETIS.

There are however some writers who have attempted the solution of that problem; but on such a subject, the conjectures of theologists deserve no more attention than the predictions of visionary prophets.

SOPHRONIUS.

Most certainly not.

DIALOGUE XIX.

PARMENIO.

THE Deluge having been mentioned in our last conversation, I am extremely desirous of knowing the sentiments both of Polymetis and Sophronius respecting that extraordinary event. Was it, in your opinion, really a universal deluge, or did it extend only over the part of the world then inhabited, as some have imagined?

POLYMETIS.

I am inclined to adopt the account of it delivered by Moses.

PARMENIO.

And you Sophronius?

SOPHRONIUS.

To some, a partial deluge may seem more probable; but I am likewise a believer in the Mosaic account.

PARMENIO.

PARMENIO.

There are two arguments advanced against the probability of a universal deluge, which strike my mind with some force: One is, that the dimensions of the ark were not sufficient to accommodate so great a number of creatures both with room and provisions; and the other, that it is difficult to conceive, how the smaller cattle in particular, and the ravenous animals, could not only voluntarily assemble, but even subsist together without depredation; as it is doubtful whether the latter, in any circumstances, will ever eat of vegetable food.

POLYMETIS.

In respect of the first argument, perhaps those who advance it form their calculation upon a supposition, that the animals admitted into the ark were arrived at their full growth. But there is reason to conclude, from the wisdom of Providence, which we have lately ascertained in so great a number of instances, that those

animals were all taken from among the youngest of every species; and upon that principle, it is not evident to me that the ark was insufficient to accommodate them.

SOPHRONIUS.

That the animals were of the youngest of their different kinds, I think there cannot be any doubt. The most bulky of the animal tribe, are Quadrupeds, of which it is said there are about a hundred and fifty different species: now, supposing them to have been all amongst the youngest of their kinds, there seems to have been room sufficient in the ark for the accommodation of all. That structure, we are told, consisted of three stories; the length of it was three hundred cubits, the breadth fifty, and the height thirty.

PARMENIO.

But do you make allowance for the stowage of provisions?

SOPHRONIUS.

SOPHRONIUS.

Provisions? Yes, in quantity sufficient to preserve in life the whole inhabitants of the Ark, during the continuance of the deluge. We may well suppose, that Noah distributed to the different animals their rations of provision with a frugal hand, and not by the common estimate of the commissary of an army.

PARMENIO.

But why should the deluge extend over the whole earth, when probably the greater part of it was then uninhabited?

SOPHRONIUS.

That is a question which relates entirely to the will of God, and therefore not an object of enquiry.

POLYMETIS. .

We have admitted the universality of the deluge only upon the authority of the Scriptures, but it seems to be likewise confirmed by some physical observations.

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Towards the tops even of the highest mountains, there have been found in the earth marine shells, which could never have been so deposited but by means of a general deluge.

SOPHRONIUS.

Yes, that I think is an unanswerable argument in favour of its universality.

PARMENIO.

Is it not surprising, however, that the memory of so extraordinary an event should not have been preserved to the present time, by uninterrupted and universal tradition?

PARMENIO.

It is the nature of oral tradition to become gradually more faint, after a long succession of ages, until at last it is extinguished among the dubious events of remote times. But that the tradition of it subsisted through many centuries, no doubt can be entertained: and upon this basis, we may reasonably suppose it

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was, that Ovid founded his description of the deluge in Greece, so much embellished with poetical beauties.

SOPHRONIUS.

It is observable, that even according to the system of Ovid, the wickedness of the Antediluvians was the occasional cause of the deluge.

POLYMETIS.

Their wickedness seems to have been in proportion to their longevity.

SOPHRONIUS.

And was perhaps a natural consequence of it.

POLYMETIS.

It is not improbable. For by placing the prospect of death and judgment at a great distance, it weakened the restraint of conscience and religion upon the gratification of their passions. A certain reprobate, of whom you have heard, is said to have declared, that upon condition

tion of enjoying every sensual pleasure, without interruption, during a period of one hundred years, he would not scruple to endure the torments of hell to eternity. —What a wretched mortal, Sophronius! Yet the wished-for tenure of this man's enjoyment was much shorter than that of the Antediluvians.

SOPHRONIUS.

Most men, till they arrive at a certain age, seem to judge like children of the future duration of time. A few years appear to them as a period of great extent; and with all their experience of the quick succession of the past, they still, in looking forward, indulge themselves in the delusion.

POLYMETIS.

It is perhaps one of the most fatal weaknesses in human nature.

PARMENIO.

And as fifty or sixty years of probation are now so much mispent, what must have

have been the abuse of time comparatively, when the life of man extended to several centuries?

POLYMETIS.

We owe it more to the mercy than indignation of God, that he contracted the span of life after the deluge.

SOPHRONIUS.

As a state of probation, it is still sufficiently long. We have only to employ it according to the dictates of religion and virtue.

END OF THE
DIALOGUE

DIALOGUE XX.

PARMENIO.

DO you think that there were no great achievements performed in the world, before the Assyrian empire was founded by Ninus?

POLYMETIS.

Undoubtedly there were. Sesostris, king of Egypt, and Tanaus, king of Scythia, are said to have made numerous conquests, though their exploits are so imperfectly related, and disfigured with fable, that they cannot now be exactly ascertained. And as, according to Justin, they fought not for the acquisition of territory, but of glory to their respective nations, it is reasonable to suppose, that they exerted their force in acts of valor, correspondent to the motive which animated them.

PARMENIO.

PARMENIO.

I cannot easily comprehend what has been the pretext of war in those times, when the extension of territory was not the object of princes.

POLYMETIS.

If you will not allow their motive to have been entirely the thirst of vain glory, we may perhaps find a more substantial cause in the allurements of Asiatic plunder: but in fact, the ambitious princes of those times appear to have been actuated, in some degree, with a spirit of romantic enterprise, not unlike that of chivalry, which prevailed so much in Europe during the fifteenth and sixteenth centuries.

SOPHRONIUS.

Their expeditions, we are informed, were always against distant nations; which is more surprising, as there scarcely seems to have existed any kind of commerce

commerce between them. Does not this circumstance give room for suspicion that the transactions of remote history are greatly misrepresented?

POLYMETIS.

Yes, I think your observation may be confirmed even by the history of Semiramis, who lived some ages later than the princes just now mentioned. We are told, that after the death of her husband Ninus, being apprehensive lest the people would not submit to the government of a woman, she personated her own son, then a boy, assuming a mode of dress convenient for the imposture; and not content with preserving the extensive dominions left by Ninus, carried her arms into Æthiopia, and afterwards into India, which she conquered. That she really adopted such a stratagem, appears to me highly improbable; because, if her son was, as is said, a young boy, she neither could well conceal the artifice, nor avail herself much of his authority. But it is still more improbable that she was murdered

dered by her son, for making the unnatural requisition of partaking of his bed; especially as this event is said not to have taken place till forty-two years after the death of Ninus.

SOPHRONIUS.

The whole history of the Assyrian monarchy is involved in great obscurity: for though that government is said to have existed one thousand three hundred years, we know not so much as the names of any of the princes from Ninya, the son of Semiramis, to Sardanapalus, the last of the Assyrian line of kings.

POLYMETIS.

The monarchy of the Medes, which immediately succeeded the Assyrian, is equally imperfect in its history: for the names of only the first and the last of the kings, Arbactus and Astyages, have been preserved from oblivion.

PARMENIO.

What is your opinion of the birth of Cyrus, by whom the imperial government

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was

was transferred from the Medes to the Persians? The dream of his grandfather, the exposure of the young prince, and his being suckled by a bitch; do not all these circumstances bear a strong appearance of fiction?

POLYMETIS.

I have not a doubt but they are fabulous; and they so much resemble those which relate to the founder of the Roman government, that one of the narratives may be considered as a counter-part of the other. We behold, however, in Cyrus, as he is represented in history, the most accomplished and amiable prince of any that existed in the ancient world.

SOPHRONIUS.

His extraordinary character, it must be owned, gives a lustre to monarchy. But I suspect that its features are greatly improved by the pleasing embellishment of Xenophon. It seems to be rather an ingenious Romance, than a true biographical narrative.

POLYMETIS.

POLYMETIS.

I am indeed of the same opinion. The description might suit the character of a young Ulysses; and Cyrus, like the son of that celebrated Grecian, would appear to have been accompanied by a Mentor, though invisible to the prince. How fortunate would it be for mankind, did those who rule over the kingdoms of the earth endeavor to conduct their administration by the model of Cyrus! When Xenophon wrote the *Cyropaideia*, I should be inclined to think that he preferred a monarchical government, under the direction of a wise prince, to the free but turbulent constitution of the Athenian republic.

SOPHRONIUS.

The idea seems highly probable: for annexing the most amiable qualities to the object of his description, he infuses indirectly into the minds of his readers a prepossession in favor of such a monarchy. But was it not impolitic to draw the character of a Persian prince in so pleasing a

light, at a time when the States of Greece contended for their liberty with the powerful sovereigns of that nation?

POLYMETIS.

Had the character of Cyrus been in any degree applicable to Darius or Xerxes, there might be ground for censuring the conduct of Xenophon upon a principle of policy; but such was the contrast between the former and the two latter of those princes, that any comparison of them could reflect neither love nor esteem upon the imperial invaders of Greece.

PARMENIO.

Considering both the prudence and military talents of Cyrus, I never can think it probable, that with an army of two hundred thousand men, he should have been so completely defeated by a female commander, as that not one of the number should survive. The horror of his catastrophe, one should think, is likewise fictitiously exaggerated. We are told that
Tomyris,

Tomyris, having caused his head to be cut off, ordered it to be thrown into a vessel filled with human blood, accompanying her savage revenge with terms of reproach: "There, said she, riot in that blood for which you thirsted, and of which you was always insatiable."

POLYMETIS.

That Cyrus and his army were cut off by stratagem, appears to be sufficiently confirmed; and in the invasion of a foreign country, such incidents are not uncommon: but that not one of the whole was left alive, may indeed be a groundless exaggeration. With respect to the circumstances mentioned of his catastrophe, as they are related only by Justin, their authenticity may be questioned. There are several incidents in the history of the Scythians which seem to be fabulous.

PARMENIO.

I recollect one in particular, which is memorable on account of its singularity. The Scythians, on their third expedition

pedition into Asia, had been absent from their wives and children for the space of eight years: and no intelligence being received from them, their wives concluding they had perished in the war, married their male slaves, who had been left at home to tend the cattle. The masters, on their return, were attacked upon the borders by these men, who endeavoured to repel them from the Scythian territories. The war between the rivals was carried on for some time with a variety of fortune: until at last, a proposal was made by one of the masters amongst themselves, that laying aside the use of military weapons, they should attack their opponents only with rods, switches, and such like instruments of correction as they had formerly been accustomed to employ in their magisterial capacity. The result was, that the slaves, who had hitherto displayed great courage in battle, when opposed with swords and lances, no sooner beheld the rods lifted up against them, than recollecting the stripes they had formerly received,

received, and which they dreaded much more than wounds, betook themselves to flight. Such of them as were taken perished upon the cross; and the women, unable to endure the reproach of their former husbands, had recourse to a voluntary death.

POLYMETIS.

IF the anecdote be really authentic, it may serve to ascertain a doubtful principle in human nature; which is, how far, in the minds of slaves, the fear of resentment will preponderate over courage, when their lives seem not to be in danger. We know that the prospect of great and immediate danger will excite the most timid to acts of valor, in defence of their own safety; but fear, when it operates in a less degree, represses, instead of exciting, every effort towards resistance.

SOPHRONIUS.

SOPHRONIUS.

I should imagine, that in this case, the slaves were much influenced by an association of ideas. The sight of the rods and switches not only brought to mind the chastisement which they formerly used to receive from the hands of their masters, but revived the remembrance of their own comparative inferiority, and by that means damped the courage which was necessary for maintaining the contest.

POLYMETIS.

You account for the moral phenomenon with philosophical acuteness. It was happy for the masters that the stratagem proved so successful: for had the fortune of the slaves prevailed, the latter would doubtless have severely retaliated upon their former lords, when flushed not only with the triumph of victory, but the secure possession of the wives and fortunes of the vanquished. One should think,

think, however, that the reception which the masters met with on this occasion, would abate the national propensity to the invasion of foreign and distant countries.

SOPHRONIUS.

It would doubtless be a natural effect : and I think, that from such a propensity, both of the Scythians and Egyptians, a way was paved for the more speedy and complete establishment of the Assyrian monarchy. For the eastern nations being the people who were exposed to the inroads of those invaders, they would be more disposed to join each other for their mutual defence ; and as the authority of one potentate might be exerted with greater and more immediate advantage than of several distinct princes, they would be willing to place the whole executive power in the hands of that prince under whom they could enjoy the most effectual protection.

POLYMETIS.

POLYMETIS.

You assign a very probable reason for the rapid elevation of the Assyrian monarchy; and from that epoch, we hear no more of any hostile expeditions made either by the Scythians or the Egyptians.

